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The Automobile and Weekly MOTOR REVIEW 10 Cents

NEW YORK SATURDAY, JULY 12, 1902 CHICAGO

HAVING to the casual observer the characteristics of

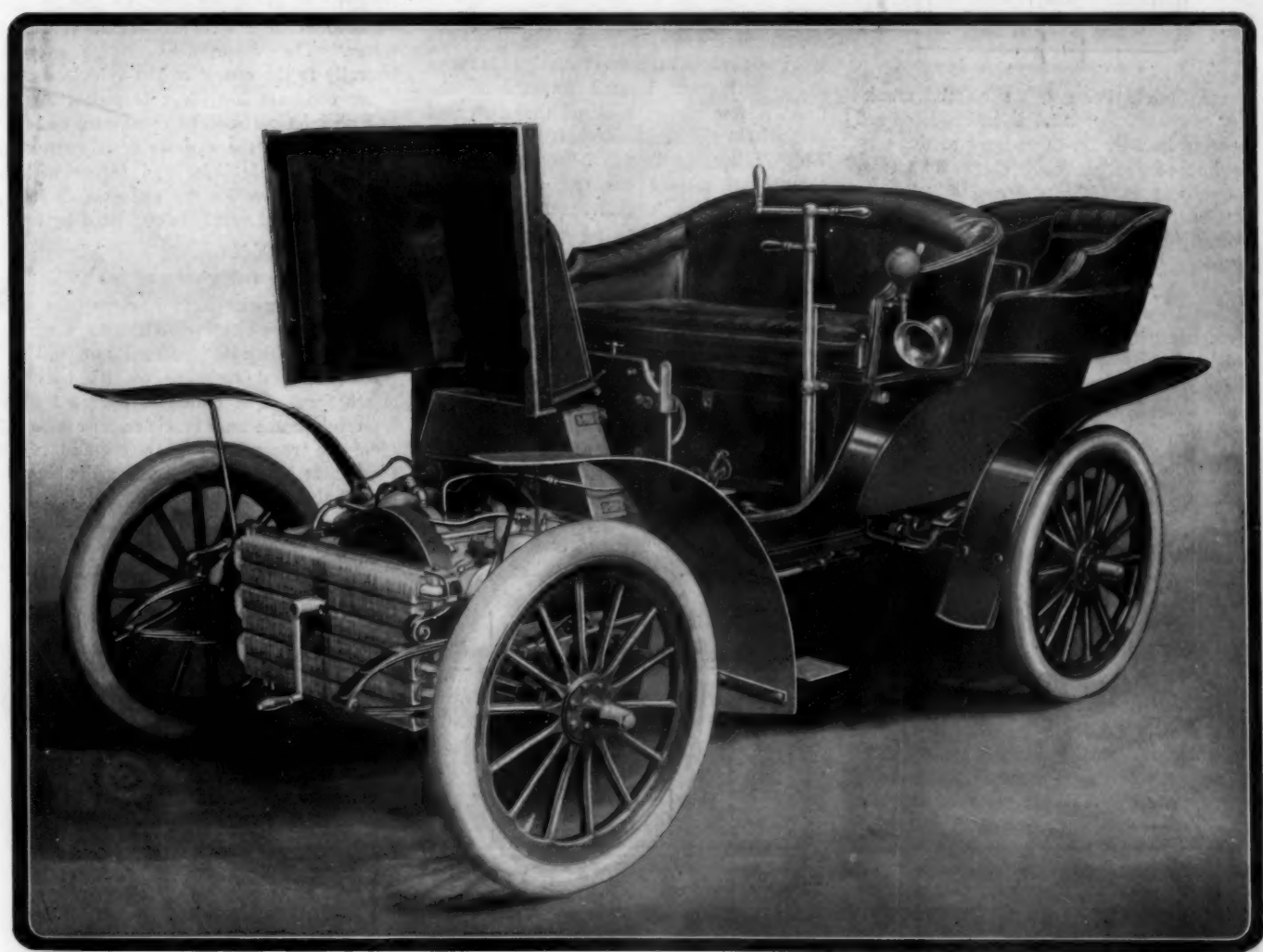
THE AUTOCAR TONNEAU

a typical French carriage such as those most commonly brought to this country and by which the current idea of French methods is gained, the Autocar tonneau is in reality a clever combina-

tion of the water-cooling radiation system; speed changes by sliding spur-gears, and transmission by longitudinal shaft and bevel-gears. On the other hand it has a

the same size, and less bulky lines.

The entire running-gear is after the French style, with a single and peculiar exception; the forward end of each front spring, instead of being hinged to a "pump handle" extension from the wooden side-



TONNEAU OF 10 H.P. BUILT BY THE AUTOCAR COMPANY, ARDMORE, PA. 1902

tion of both European and American practice. It has the rectangular frame, with motor in front under a bonnet; the artillery wood wheels; the extreme forward disposi-

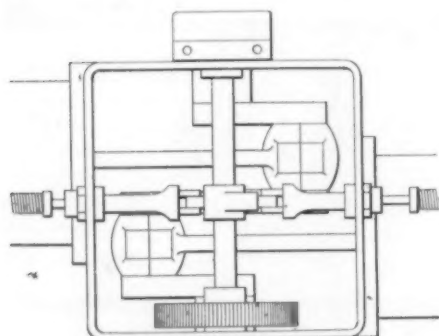
tion of the water-cooling radiation system; speed changes by sliding spur-gears, and transmission by longitudinal shaft and bevel-gears. On the other hand it has a

bars, meets a quarter-elliptic spring, thus forming a regular three-quarter elliptic spring with shackle connection to the frame at the rear. The wheels are 30 inches in

diameter and are fitted with 3-inch pneumatics. The track is slightly less than standard; 4 feet 6 inches.

The Autocar Motor

The motor, which is of the simple four-stroke cycle opposed type, is supported low down in the frame with its shaft lying longitudinally. It is not large, being rated at 10-h.p. The method of exhaust-valve operation and a device tending to prevent the lubricating oil from working backward past the pistons by capillary action are its most noticeable features. The former is shown in an accompanying illustration.



Valve-stems and cams

The cylinders being offset on the crank-case, each cylinder-head is inclined inward to bring its exhaust-valve stem to the center line of the crank-chamber. The two-to-one gear is within the casing, adjacent to the front wall, while the cam-shaft runs centrally across the chamber near its top. In the center of each end of the casing is a hub through which slides a pin or rod having on its outside extremity a block that abuts against the end of the spring-controlled exhaust-valve stem. The inner end of the sliding rod is enlarged and forked to support a roller engaging the surface of the centrally disposed cam-block on the two-to-one gear-shaft. The operation of the valve lifts is obvious. The cam-shaft extends through the rear wall of the casing to operate the sparking device encased upon it in the usual manner for spark timing. The accompanying plan view of the vehicle shows the link and bellcrank connection between the spark-shifter and a light vertical shaft close to the vertical steering-post.

The Lubricating System

The tendency for the lubricating oil to work past the pistons is reduced by the formation of a partial vacuum in the crank-casing. A small pipe is fitted to the cover of the casing on the extension of the latter to accommodate the cam-shaft gear, this location probably being selected as the one least liable to permit the entrance of oil into the pipe. The pipe is bent to a horizontal position and then downward, its free open end being below the motor. In the horizontal portion of the pipe is a small ball check-valve which opens under outward pressure. When the opposed pistons move toward each other a portion of the air in the casing is driven out past the check-valve in the pipe and a partial vacuum results, the

check-valve preventing the return of air through the pipe upon the opposite movement of the pistons.

The oil for the splash lubrication is fed into the crank-casing through a pipe attached to the center of the cover and leading from a Lunkenheimer sight-gravity-feed reservoir on the dashboard. The motor is started by a crank which attaches directly to the forward prolongation of the motor-shaft. The batteries are under the left end of the driver's seat.

The water-tank for the motor cooling system is placed in front of the dash and under the bonnet, the central portion of its bottom being concave to clear the rear of the two motor fly-wheels. The cooling of the water is by the ordinary radiation tubes, while the circulation is by means of a small rotary pump. This is below the motor and is driven directly from the rear fly-wheel by means of a friction wheel on the pump-shaft. The method of water-pipe connection to complete the circuit is shown in the plan view.

The Carbureter

The gasoline supply is in a large tank occupying the major portion of the body space underneath the front seat. It is taken to a carbureter located underneath the floor, a few inches back of the dash and just within the right side-bar of the frame. This carbureter is of the popular, two-chamber, float-feed variety and is of the Autocar company's individual design and manufacture. There is no especial novelty in the float chamber, but the mixing chamber is peculiarly constructed to accomplish the much-desired end of being able to throttle the delivery and at the same time to automatically alter the richness of the mixture in the assumed correct ratio. The air is taken into the carburation chamber near its bottom and a vertical partition or web divides the lower portion of the chamber so that the entering air passes into both sections. The vertical spraying-nozzle projects centrally within the larger of the divisions. Arranged to fit snugly and turn within the upper and individual portion of the carbura-

project over both sides of the partition. The delivery opening is in the side of the upper section of the carburation and the rotatable cup has a side wall hole of equal size adapted to register with it.

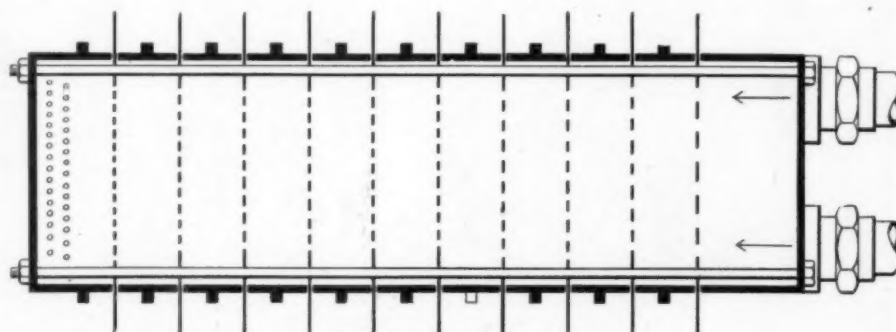
The operation of the device is simple. The amount of vapor delivered depends upon the degree to which the two delivery holes approach perfect registration, while the proportion of fresh air added to the mixture depends upon the portion of the segmental opening in the cup bottom which projects over the fresh air chamber relative to the portion over the mixing chamber. By carefully proportioning the parts a result is secured whereby when the cup is turned to cut down the total delivery it also cuts down the size of the fresh air opening relative to the mixture opening and causes the delivery of a richer mixture.

Slightly warmed air is used in the carbureter. This is secured by terminating the air inlet pipe directly back of the water tank, so that the air entering it will be forced to pass along the rear side of the tank, which is always more or less heated, on account of the rapid circulation of the water. The vapor delivery-pipe extends laterally to the center of the vehicle, where a tee connects it with a U pipe reaching to both inlet ports. The crank-arm or lever for regulating the carbureter is connected through suitable links and levers with a rotary spindle within the main clutch lever, so that the fuel supply is regulated by turning the handle.

The Transmission System

The driving-clutch is a strong, quickly acting wooden-block clutch with the rear fly-wheel, which is recessed and with a screw fastened covering on its back or clutch face. The clutch is operated by a lever fulcrumed on a bracket arm extending from the transmission gear-case and which terminates in a fork engaging a double collar on the clutch-shaft. The outer end of the lever connects directly by a link with the hand lever.

The sliding spur-gear speed-change group



SECTION OF MUFFLER

tion chamber is a cup having a central spindle which passes upward through the cap to afford means for turning the cup. The floor or bottom of the latter, which rests upon the vertical partition, is cut out segmentally to form an opening which will

furnish three forward and a reverse drive. It is encased in a box which is supported by two angle-irons extending across the vehicle frame. The clutch-shaft is in line with the driving-shaft, so that on the highest speed the two are locked for direct

transmission. The other speeds are, of course, obtained by transmission to the idle-shaft and back to the driving-shaft. The shifting-gear shaft is between and above the others and is operated through a bell-crank and several links by the sleeve or tubular shaft which encompasses the steering-post, its operating handle being a few inches below the steering handle. From the speed-change gear the transmission is directly to the bevel-gear-driven differential on the live rear-axle by a longitudinal shaft with universal-joints at both ends. These joints are protected against dust by leather sleeves, as shown in the plan view.

The Muffler and Brakes

The Autocar muffler is unique. It is a box of rectangular section built up from several cast sections drawn together by end-to-end tie-bolts and between which are placed sheet metal baffle-plates that pro-

There is no hand-brake, both the regular and emergency brakes being operated by foot pedals. The former comprise two band hub brakes acting on drums of more than common width. The emergency brake is also a band-brake, it acting upon a drum on the rear end of the transmission-shaft. All of the parts are so placed that they are readily accessible, it being possible to reach practically all parts by raising the motor-bonnet and lifting the removable floor.

THE STANDARD CHASSIS

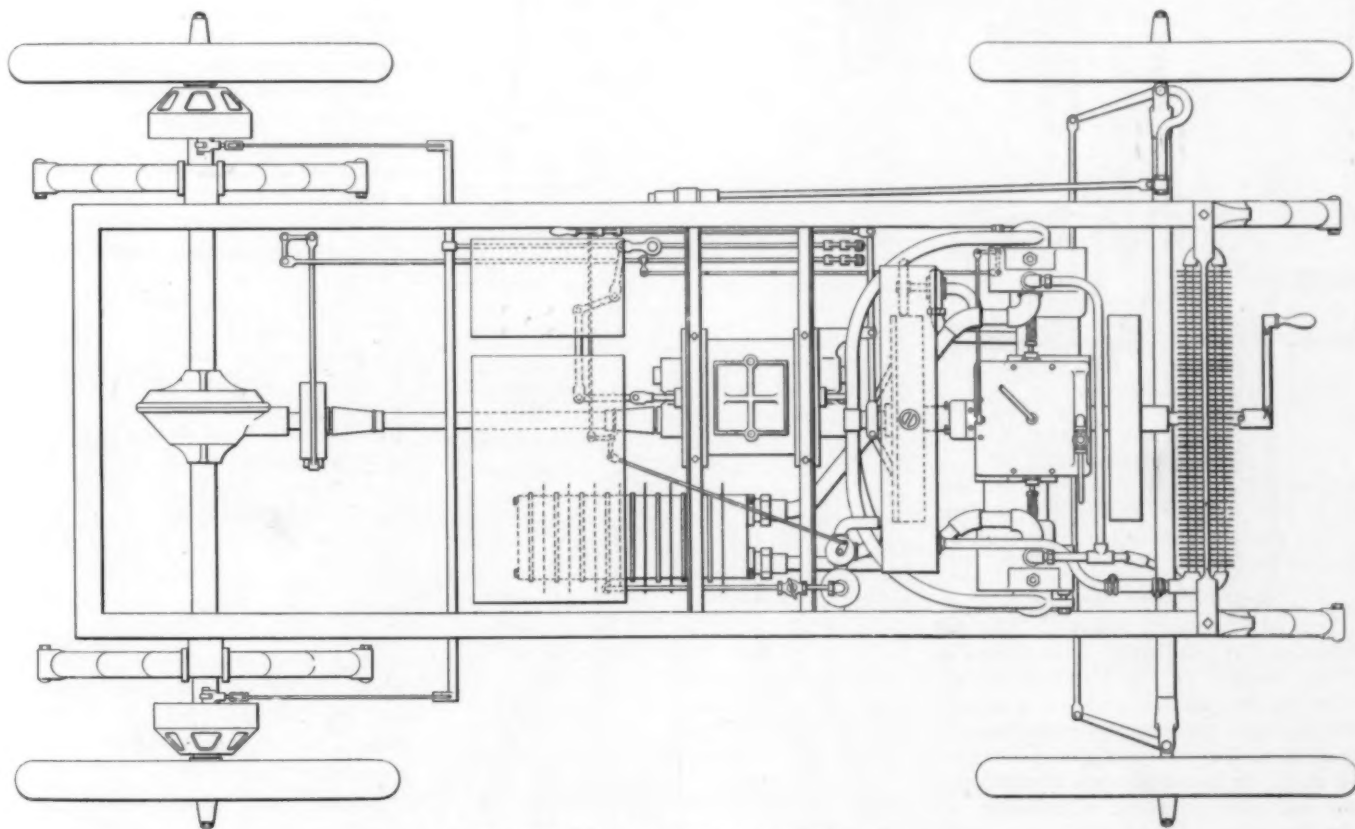
A correspondent in *La France Automobile* points out that the committee appointed by the *Chambre Syndicale* to recommend standards for body dimensions overlooked the fact that the steering wheel must have a fixed relation to the operator's seat rather than to the dash, and that the dimensions

Width of chassis: Voiturettes, 0.80m.; light voitures, 0.80m.; voiture, 0.85m. (as recommended in the committee's report).

Length of body, from rear end to center of steering wheel: Voiturettes, 1.40m. (55½ in.); light voitures, 1.50m. (59½ in.); voitures, 1.60m. (63½ in.)

Height of footboard: Voiturettes, 0.05m. (2 in.); light voitures, 0.07m. (2¾ in.); voitures, 0.07m.

The above figures for length are derived from those of the committee's report by subtracting 40 cm., or 15¾ in., in each case for the horizontal distance from the steering wheel center to the back of the dash. Allowing 16 in. for the diameter of the wheel, and remembering that the back of the wheel rim is nearly in a vertical line with the front edge of the seat, these figures give, roughly, 24 in. of footroom. This is enough without being too much, and the



CHASSIS OF THE AUTOCAR TONNEAU

ject outwardly to afford additional heat-radiating surface. Each plate is pierced by a series of holes which vary in size from plate to plate. The exhaust after entering the muffler passes through a few large holes in the first plate, then through a greater number of smaller holes in the second, and so on through the series until it passes through a large number of fine holes in the last plate. The final exhaust is through a double row of small holes in the bottom of the last compartment of the muffler. The walls of the muffler sections are cast as thin as possible and are strengthened by small external ribs.

in the committee's report are, therefore, insufficient to secure complete interchangeability. To cover this point he proposes that the length of the body be measured from its rear end to a point directly below the steering wheel center, instead of to the back of the dash. This leaves the major portion of the footboard, as well as the toe-board, to be treated as part of the chassis, and necessitates a standard height for it as well. This height he proposes to measure from the top of the wood sheathing, which covers the side sills of the frame, to the top of the footboard. He suggests the following dimensions:

diversity of practice in regard to the location, slope, etc., of the steering column seems to make some such addition to the standards necessary.

Naturally, it is implied that the footboard shall have the same width as the chassis, and that whatever trimming may be put on it at the sides shall drop flush with the top at the point of separation between body and footboard.

Automobiles for carrying the Russian mails across the Caucasus are to supplant the present transport of post horses, with changes every 10 miles.

The Gasoline Vehicle

IV. HIGH-SPEED AND VALVE DESIGN*

Given a good mixture and correctly timed ignition, the most important factor in determining the attainable speed of an explosion motor will be the design of its valves. The main reason why a stationary engine, designed for a certain speed, will

by the walls of the valve chamber, as it is apt to be, a lift of one-half its diameter is hardly too much to give the gases free passage.

The inlet valve, if sucked open, as it usually is, should be as large and light as

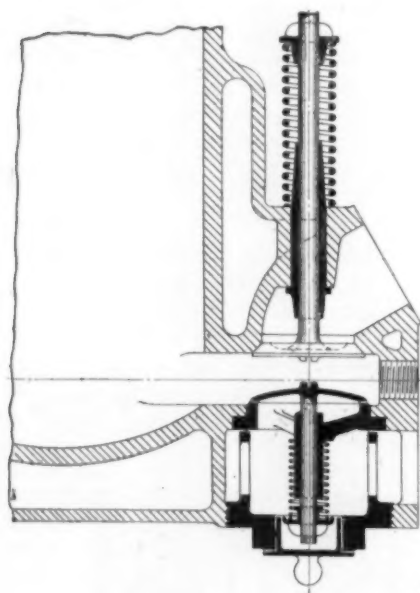


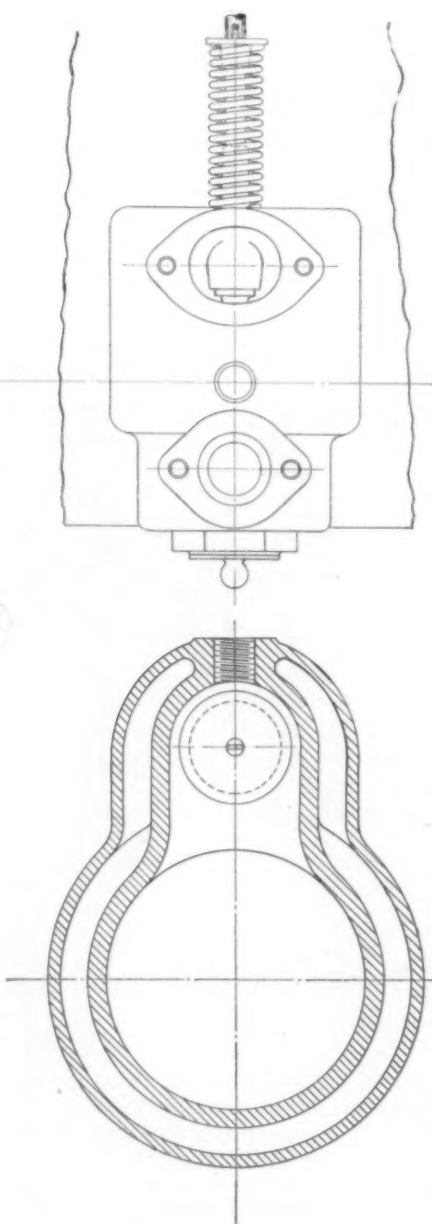
Fig. 1

not run materially faster without weakening is that its valves, ports and passages are too small to convey the gases with the requisite rapidity.

Liberal Diameter Necessary

A good design of exhaust and inlet valves for a vertical engine is shown in Fig. 1, and another in the drawings in the article of June 21. The valves, both inlet and exhaust, are usually made vertical where possible, whatever the position of the motor, so as to insure concentric motion and even wear. It is customary to base the valve sizes on the mean piston speed, the latter being found by multiplying the length of one stroke in feet by the number of strokes per second. Then the valve area is made such that the velocity of the gases through the valve shall not exceed a certain limit—usually from 90 to 100 ft. per second. As the limit is arbitrarily taken, the expansion of the exhaust gases is ignored and they are regarded as occupying only a cylinderful of space. The lift of the exhaust valve should not be less than one-fourth the smallest diameter of its seat, and when closely surrounded on three sides

*The series on "The Gasoline Vehicle" was begun in the issue of June 7. Although treating of a common subject, the several articles will be self-contained, so that any of them may be read without reference to others of the series.



possible. It should never be smaller than the exhaust valve, and is better larger. It is becoming customary to carry this valve in a cage or bushing, as in Fig. 1, which may quickly be removed for inspection or regrinding of the valve, which, with its necessarily light spring, is more apt than the exhaust valve to be made to leak by

dirt on its seat. If, as is usual, the inlet valve bushing is directly over the exhaust valve, removal of the former exposes both valves.

Consequences of Valve Inertia

The valves, like other moving bodies, have inertia, and at high speeds it is sometimes difficult to get them to close rapidly enough. Very stiff springs are needed on the large exhaust valves of high-speed motors to make them "follow the cam;" while, with all possible lightening of the inlet valves, the springs on these must sometimes be made so stiff as to reduce the sucked-in mixture to an undesirable extent.

In the case of the inlet valve, whose spring it is not permissible to stiffen *ad lib.*, by simply strengthening the connected parts—as may be done with the exhaust valve—there is a decided limit to the increase of size in order to obtain high engine speed, as will be evident from a simple application of the laws of mechanics. As the valve lift is as short as possible, to insure the valve closing promptly, and as the valve spring is always under tension, it follows that the change in spring tension between the open and closed positions is small, and we have approximately the case of a mass to be accelerated by a constant force through a given space in a given time.

Calculating the Spring Tension

If we put

M = the mass of the valve,

W = its weight in pounds,

F = mean spring tension,

f = the acceleration of the valve,

s = its lift in feet,

t = elapsed time of closing in seconds,

g = acceleration of a falling body

= about 32.2 ft. per second,

then we have, by mechanics,

$$(1) s = \frac{1}{2}ft^2$$

$$(2) F = Mf$$

But

$$W$$

$$M = \frac{W}{g}$$

Therefore

$$F = \frac{Wf}{g}$$

Transposing (1),

$$f = \frac{2s}{t^2}$$

Therefore

$$(3) F = \frac{W}{g} \times \frac{2s}{t^2} = \frac{2Ws}{gt^2}$$

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in which $\frac{2Ws}{gt^2}$ is constant, s may be limited as desired by a stop, as in Fig. 1, and t will depend on the piston speed and W on the diameter of the valve.

Evidently, if no change is made in the size of the valve, the spring tension required will increase in proportion to the lift and to the square of the speed. But if the valve is already working to the limit of its

capacity, an increase in speed necessitates a larger valve. Let us see what this means.

Suppose the weight, lift, and time of closing of the original valve to be known, and we put

$$W=a$$

$$s=b$$

$$t=c$$

$$\text{Diameter of valve}=d.$$

Suppose the speed to be doubled, so that

$$t_1=\frac{1}{2}c \quad \text{and}$$

$$t_1'=\frac{1}{4}c^2,$$

We may either (1) double the area of the valve, and increase its lift so that the area of escape from the edge of the valve will likewise be doubled, or (2) we may double the area of escape by doubling the diameter of the valve without increasing the lift. In the former case,

$$d_1=d\sqrt{2}$$

$$s_1=\sqrt{2}$$

If all the valve dimensions are increased in proportion,

$$W_1=a\left(\frac{d_1}{d}\right)^2=a\times\frac{d^2\times 2}{d^2}=2a$$

$$F_1=\frac{2}{g}\times\frac{2a\times 6\sqrt{2}}{\frac{1}{4}c^2}$$

$$=\frac{2}{g}\times\frac{4ab}{\frac{1}{4}c^2}=\frac{2}{g}\times\frac{16ab}{c^2}$$

Then $F_1=16F$, or the spring tension is multiplied by 16, while the valve area is only doubled. Consequently the resistance to opening due to the spring is eight times as much per square inch of area as before.

In case (2),

$$d_1=2d$$

$$s_1=s=b.$$

$$W_1=a\left(\frac{d_1}{d}\right)^2=4a$$

$$F_1=\frac{4}{g}\times\frac{8ab}{\frac{1}{4}c^2}=32F$$

As the valve area is quadrupled, the resistance to opening is multiplied by eight, just as in case (1). Theoretically, therefore, the resistance to opening in either case increases as the cube of the speed.

A Practical Case

Practically, the case is not quite so bad, because a higher velocity of passage is permissible with large than with small valves, so that the valve openings will not need to be quite doubled. Again, the valve stem in case (2) will be the same length as in the original valve, and a little weight will be saved thereby. It is on this latter account that large valves with small lifts are preferred for high speeds. We may apply the rule to a practical case by assuming for a given valve a weight of 2 oz.= $\frac{1}{8}$ lb., $s=1.5$ in.=1.60 ft., and $t=1.50$ second at 600 r. p. m. The mean tension for the spring works out to 1.3 lb., approximately, and if the valve diameter is $1\frac{1}{2}$ ins. a suction of about 0.2 lb. per square inch will be re-

quired to open the valve. If the piston speed be doubled and the valve enlarged, the suction required will approach $1\frac{1}{2}$ lbs. per square inch, involving a reduction of 10 per cent. in the density of the charge and available power per stroke.

A similar calculation from formula (3) will determine whether the spring on the exhaust valve is stiff enough to keep it on the cam at a given speed, care being taken to have W include the weight of all parts which the spring must act on, unless they move much slower than the valve itself, as sometimes happens when the valve is opened by a lever.

Why Not Mechanically Opened Valves

It may be asked why, in view of the fact that a considerable percentage of power is lost at high speeds from the stiffness of the inlet valve spring, this valve is not more often mechanically opened like the exhaust valve. The answer is to be found in the fact that, usually, the vaporizer or carbureter is connected to the cylinders by a pipe of measurable length, and at high speeds the indrawn column of air in this pipe acquires momentum which, acting on the inlet valve, keeps it open a little after the piston has begun its return stroke, with corresponding augmentation of the charge. How much benefit will be derived from this action will depend on many things, but chiefly on the length and smoothness of the pipe, on its freedom from sharp bends and pockets, and on the velocity of the air in it. The shape of the inlet valve will affect the result also, and the mushroom shape in Fig. 1 is considered favorable to this end. A fair length of pipe is usually considered better than a very short one, on the ground that it gives the gasoline spray more time to evaporate and mingle with the air; but when the pipe is very short there is nothing gained by the momentum of the air column, and the valve may be timed mechanically. The most notable example of this is probably the Mercedes, whose carbureter is bolted either directly to the valve chamber, as in last year's model, or to a branched pipe but a few inches long, as in the Simplex. In both machines the inlet valve gear is exactly like the exhaust valve gear, save for differences in timing, the inlet valve being held open a short time after the compression stroke is begun, while the exhaust valve opens a little before the end of the power stroke.

From the foregoing paragraphs it is easy to see why weakening of the valve springs of any engine is so often followed by failure of the engine to run at speed, and also why the engines of the Napier and Centaure racing machines are fitted with three small inlet valves instead of one large one.

Allusion was made just above to early opening of the exhaust valve; and this is necessary in any high-speed motor fitted with a muffler. No rule can be given for it, of course, as the mufflers of no two makes of engines are alike; but it is a very necessary provision.

The inlet valve in Fig. 1 has a flat seat, and this shape, though not universal, is much in favor. It has the advantage of being less liable to gum and stick fast than a conical seat. It is most essential that the valves of a high-speed engine be as accessible as possible, because, being worked at a very high rate, they are more liable than the valves of slower engines to troubles, such as leakage, gumming, weakened or broken springs, etc. The valve in Fig. 1 may be taken out with its seat by unscrewing the slotted cage, or the loose cap may be lifted, exposing the top of the valve. Another method is to make the top of the cage solid, and hold it down by a strap across it; or the inlet pipe may end in a bell-shaped cap, similarly held down and jointed to the pipe so that it may be turned up to expose the valve.

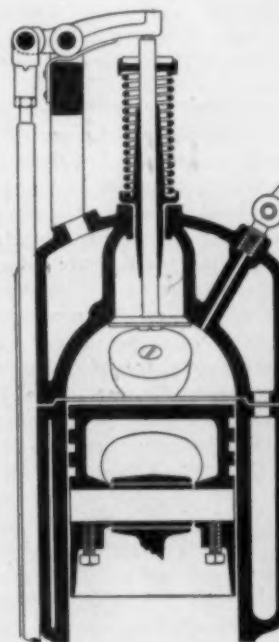


Fig. 2. The Cuiasse Buchet

In Fig. 2 is shown in section the cylinder-head of the Buchet motor. Recognizing that the arrangement shown in Fig. 1 gives the mixtures no passage at all on the outer sides of the valves, the makers of this motor place the valves so as to open directly into the head, with free passage all around them. This construction, by reducing the cooling surface surrounding the charge, is also theoretically more efficient. Mechanically it is a little awkward, but it is reported to give a motor of exceptional power, size considered.

CLEANING MOTOR VEHICLES

The interesting article on cleaning motor vehicles, in THE AUTOMOBILE AND MOTOR REVIEW of last week, should have been credited to the new catalogue of the Wolseley Tool and Motor Car Co., of Birmingham, Eng.

THE FRENCH DESIGN OF TODAY

An English writer, who conceals his identity under the style of "Stone of the Bridge," gives his impression of French progress, as manifested in the recent exhibition there, in a recent issue of *La Locomotion*:

One point in particular I noticed (he says in part)—the almost total absence of large vehicles for passenger transport. That was particularly noticeable among racing cars, and was unquestionably due to the fact that cars weighing over 1,000 kilos are now debarred from contests organized by the principal continental clubs. At the previous exhibition I noticed a number of vehicles of different make for public transport, but this year I saw very few.

In no make of car is the reduction of weight more remarkable than in the Panhard. Its total width has been reduced, and weight has been cut down even in the smallest cars. It is even possible that this effort after lightness has been pursued a little too far.

Frame Construction

The construction of the *chassis* has been considerably simplified. The main frame is now commonly composed of but a simple rectangle of either tube or angle iron; a second rectangle of smaller dimensions is placed inside the main frame towards the front, for the purpose of supporting the motor, and often of the speed changing gears as well. In numerous cases the side sills of the frame are of T-iron. When tubes are employed, those at the sides are double, and a vertical strut connects the tubes midway between the ends. With angle iron, the vertical flange is deep in the middle and is gradually reduced towards each end. Frequently the inner or false frames are made of angle iron when the main frames are tubular. The connection between the main and false frames, in several cases, has not been accomplished without considerable difficulty. The best of the solutions did not impress me favorably, and I was astonished to see the system employed by the most noted houses.

Single-Cylinder Motors

Although De Dion, Bouton & Co. have at last decided to fall in line and place the motor in front, they still cling to the single cylinder motor, in spite of the fact that almost every other house has now adopted two or more. They have even carried that idea into execution with a motor of 12 h. p.; but, having apparently discovered that its vibration was disagreeable, they have balanced the motor piston by a dummy piston moving in a separate cylinder with an open head, so that the vibration is partially relieved. Opinions were much divided regarding the advantages or the reverse of this system, as the visitors at the Show were enlightened regarding it by the exhibitors. The car upon which this motor was mounted had the same complicated speed-changing gear as the *voiturette*, the

two speed-changing shafts carrying two racks and operating on expanding clutches, two speeds being obtained by one of the racks, and the third speed and the reverse by the second. The speed-changing gear was, as always, suspended from the *chassis*, and universal joints permitted the play of the springs.

Governors and Carbureters

Lepape showed us a single-cylinder motor provided with a gas pump, by which an explosion was obtained at each revolution, but there again the complication was certainly not compensated for by the result obtained. The Panhard principle of governing on the admission was generally followed; but the "Herald" motor, which in its *ensemble* seemed well built, has retained the governing on the exhaust. The Aster, De Dion and Abeille motors, in the order named, appear to be the prime favorites.

In the Peugeot cars, which have been considerably modified, the admission and exhaust are both controlled by the governor, but the ignition lead is still regulated independently by the operator.

Water-cooling has come into general use, although several houses content themselves with jacketing only the cylinder-heads. Rochet & Schneider and several others have adopted a radiator composed of a vertical tank placed at the front end of the hood and pierced by horizontal tubes through which air is drawn at high speed by a fan revolving back of the reservoir. The idea is not bad in itself, but it gives a rather ungraceful appearance.

The Longuemare carbureter is much used. In the new vehicles shown by Charron, the water circulation passes around the carbureter. Alcohol does not seem to have been studied very seriously, although the Gobron-Brillié carbureter was claimed to be able to operate with either petrol or alcohol.

Tube and Spark Ignition

Ignition by incandescence has practically survived, an arrangement of spongy platinum, which permits advance or retardation of ignition in the tube, having made a very recent appearance. In the Renault *voiturettes* the spark coil is placed on the front of the dash, and the dash is cut open back of it, permitting easy access to the coil by the operator and giving the advantage of a very compact wiring circuit. Ignition by magneto is growing popular, and may be considered a formidable rival of accumulators, if indeed it will not replace them.

In the Panhards the steering-column carries only the steering-wheel, the handles for controlling the motor being mounted on the dash in front of the operator, who is obliged to lean forward over the steering wheel to reach them. Charron employs four small levers, all placed in the same awkward position. On the other hand, there is a tendency to fix the speed-changing levers and the control handles on the steering-column.

On the relatively light cars, the transverse countershaft and chains are often replaced by a longitudinal shaft with universal joints. A very simple method of obtaining the high speed direct was shown by Richard, Boyer and others. A large pinion on the motor shaft is continually in mesh with the smallest pinion on the intermediate shaft. The shaft with universal joints is co-axial with the motor shaft, and carries a sleeve on which are mounted two pinions so arranged that either in turn may be put in mesh with corresponding pinions on the intermediate shaft. The sleeve is splined on the jointed shaft, and carries a claw clutch at its front end, which may be engaged with corresponding claws on the motor shaft. When these are engaged, the motor shaft drives the jointed shaft direct, and the intermediate shaft turns freely. For the other speeds, the sleeve is shifted to disengage the claw clutch, and moved to engage one or the other of the two pairs of pinions for the first or second speeds. The driving force is then transmitted to the jointed shaft through the intermediate shafts. It would be difficult to find anything more simple. In many cases, a distance rod is jointed to the rear axle near the differential case and to a rigid part of the *chassis*.

Speed-Changing Gear

In the Panhard speed-changing gear the several forward speeds and the reverse are now operated by a single lever at the side. By employing two short gear sleeves instead of one long one, and by shifting the lever from one slot to another to operate them both, Rochet & Schneider are able to pass from the high to the low speed without passing through the intermediate speeds. Leon Bollée and one or two others have motor and gear case cast in one, to avoid loss of alignment, but this seems rather difficult to accomplish practically.

Great attention has been given to brakes, and expanding brakes are often employed in preference to band brakes: in many cases the brakes are made double acting.

THE TOOL-BOX

Much of the ease and comfort of motor-ing, especially on tour, depends on the care and forethought which has been bestowed on that too often neglected portion of the car's anatomy, the tool-box, and a glance at the interior thereof will often give the observant critic much insight into the character of the owner. The too familiar cupboard, in which spanners, oil-cans, wire, loose nuts, and—too often—inner tubes as well, wallow in a marsh of spilt oil, grease and resin, sometimes has a variant in a clean and neatly-kept receptacle, in which the orthodox set of tools repose in assorted places, but from which all else that could be useful in an emergency has been carefully omitted; nor does it appear that anyone has as yet placed on record what, in his opinion, a well-regulated tool-box ought

to contain, an omission deserving an attempt at remedy from more than one pen.

Lubricants will, of course, occupy an important place, and an oil-can and grease injector, with reserve stock of oil, grease, graphite, resin and French chalk, also a small can of paraffin for valve grinding and lamps, and flour emery, will include most things necessary of this kind, a collection which is if possible, best kept apart from the tools and replacements, in the interest of cleanliness. Screw-top tins, such as used for vaseline, form the best receptacles, on the whole, for such of these as are solid; but for resin, which is chiefly wanted for brakes, clutches, and the like, an "insufflator," like those commonly vended for distributing "insect powder," is very convenient, and enables it, if finely powdered, to be squirted easily into the refractory part. If belts are used, castor oil or belt dressing should not be forgotten.

Sufficient spanners are generally supposed to accompany a car, a belief that it is not always superfluous to verify, and a large adjustable spanner, and hammer (unless the same tool serves for both) is always wanted, while a smaller one of the "Clyburn" type, most convenient for awkward corners, should accompany it. It is generally necessary also to have another one thin enough to be used on the lower of two lock-nuts, or such, if small, cannot be properly tightened, while some car-builders have a perfect genius for devising nuts in positions where a specially-shaped instrument is needful to tighten them. Screwdrivers, cutting pliers, a large file, and a watchmaker's file for coil, will also have their places, and a steel "tommy" and 6-in. or 9-in. "Footprint" pipe-wrench should be included. If touring in remote regions is intended, it is useful to have a small vice that can be clamped to the step of the car, which need not take up much room, and it is better to have a knife and scissors in the tool-box than not to have them in one's pocket.

Some parts and sundries will vary with the type of car, but plenty of nuts, bolts and split-pins should be carried, and replaced as they are used up, which precaution, though obvious, it seems almost necessary to mention, if experience of its neglect is a guide. Spare sparking-plugs, valves and valve-springs suggest themselves, as also, in some cases, a spare circulating pump, while the necessary plates and bolts for patching up a broken spring are things very inadvisable to omit in the present state of road management. Abestos sheet and string, and ready-cut packings, along with copper wire—plain and insulated—and cloths and waste, should all be there, and though it is very improbable that any one of all these multifarious items will be wanted on any particular run, like the Yankee's revolver, "when you want it you want it badly." We heard of an ultra-cautious automobilist who included a surgical bandage and plaster in his collection, and found

even that come in useful at last—to mend a leaky water-pipe!

Finally, tire-repairing necessities are a thing apart, and should be kept so, not being improved by rude contact either with tools or oil; and the harmless, necessary voltmeter is safer in the owner's pocket than elsewhere; it is doubtful even whether in the small sizes useful for ignition accumulators it can be safely screwed to the dashboard if it is to retain its accuracy, convenient as that arrangement is.—*The Motor Car Journal.*

A NEW WOOD WHEEL

The new artillery wheel shown in the accompanying illustrations is being supplied to the trade by the Neustadt-Perry Co., of St. Louis. The hub of the wheel has the bands forced on by hydraulic pressure, making them solid and compact, after which the sleeve and flange, made integrally, are inserted into the hub. The outside cup is



next telescoped over the protruding sleeve, and the bolts are passed through the cup and hub and bolted against the flange. The bolts pass between each two spokes and prevent any possibility of turning or loosening in the box. This wheel can be readily keyed to any axle or adapted to revolve on the axle when it is desired to drive the wheels independently with sprockets bolted to the spokes.

CANNSTATT-DAIMLER-MERCEDES

The following, from the *Autocar*, will be of interest to those who may have been puzzled by the lengthy name of the German Daimler vehicle. The latest product of this noted plant is, we believe, the Cannstatt-Daimler-Mercedes-Simplex motor. The cars, named "Mercedes," are built at Cannstatt, Germany, under the Daimler patents, hence the name.

When down at Nice during the spring, M. Jellinck, who is known in automobile circles as "M. Mercedes," on account of his having christened the new Cannstatt vehicles with this name, stated that the German Daimler Co. intended to do great things in the speed line next year by turning out some steam cars which were to be built to the designs of Herr Maybach. This gentleman has the very highest reputation as an automobile engineer, and he is responsible for nearly all the improvements that have been carried out in the Mercedes vehicles. If, therefore, he gave his attention to steam, it might be supposed that we could look forward to something exceptionally interesting, but it appears that rather than design a new type of vehicle he has preferred to adopt the only steam car which has proved a practical success on the Continent, and, as he has lately been putting one of the Serpollet vehicles to a very severe test in the neighborhood of Paris, there is a strong probability of its manufacture being taken up at the Cannstatt works. If this be the case, it will be interesting to see how far German thoroughness and attention to detail will influence the construction of the Serpollet cars, for it may be taken for granted that, if they are capable of improvement, Herr Maybach will not rest until he has made the most of the possibilities of steam.

GERMAN TOOL MACHINERY TRADE

There has been a rapid decline in German imports of tool machinery since 1900, in which year the imports amounted to 7,072 tons, of which 5,233 tons were purchased in the United States. The total imports in 1901 were only 1,872 tons, of which 1,282 tons were sent from this country. During the first three months of 1902 the German imports were 251 tons, as against 615 tons for the same period in 1901 and 2,235 tons in 1900. There was a decline also in the German exports of tool machinery, but it was not so great, the figures for 1901 being 9,115 tons, as compared with 10,194 tons in 1900. The first quarter of 1902 has also shown an increase to 2,649 tons over 2,300 for the same period last year.

The Saxon Ministry has given its permission for the introduction of motor cabs in the more populous towns of Saxony, inasmuch as this new mode of locomotion will retain all the features of cab service as compared to other motor vehicles.

MOTORCYCLE ENDURANCE RUN

Thirteen Competitors Out of Thirty-One Complete 254-Mile Contest from Boston to New York Despite Rain and Muddy Roads

The first motor bicycle endurance contest ever held in the United States, and, it is believed, in the world, was run on July 4 and 5, between Boston and New York, by the Metropole Cycling Club of New York. By its proof of the enduring qualities of the motor bicycle on long runs over country roads, this contest has added the one needed proof of the practicability and utility of these machines for which the public has been waiting.

Thirty-one contestants started at 8 A. M., July 4, from Dartmouth St., near Coply Square, in Boston, and ten of them finished within the time limits at 60th St. and Broadway in New York on the evening of July 5. Three others arrived several hours later.

The Route and Conditions

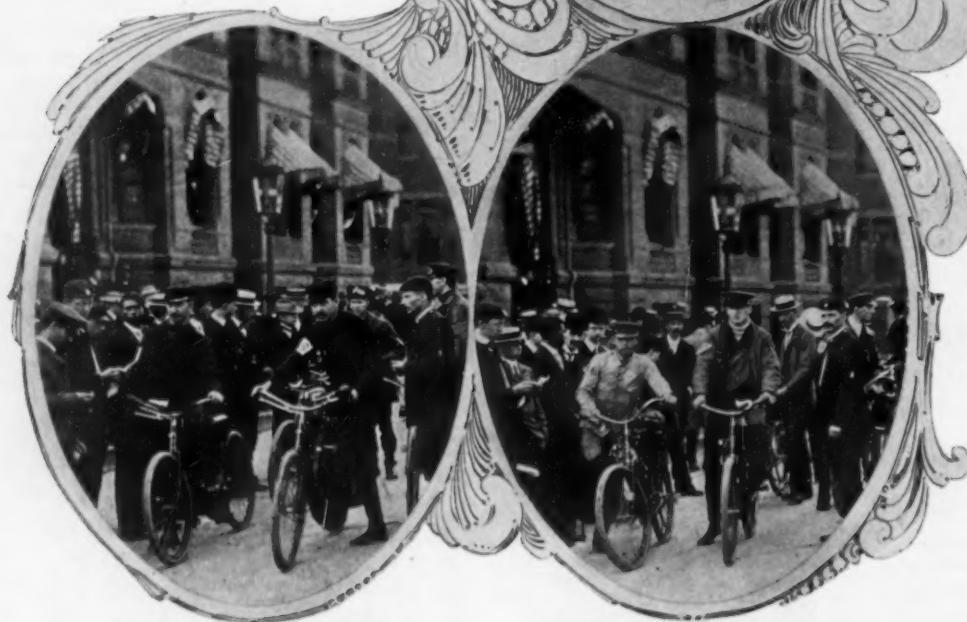
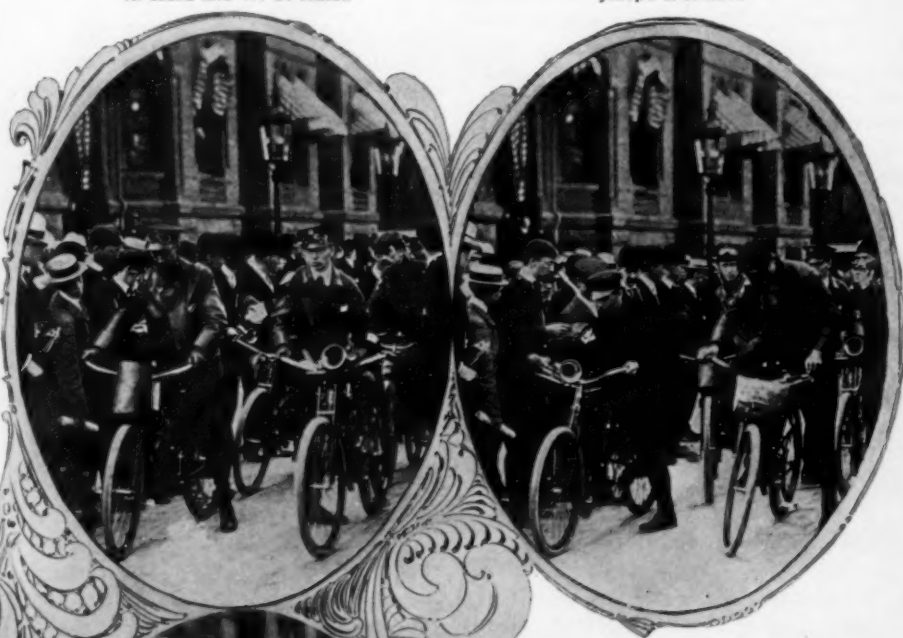
The route was over the macadamized State roads passing through Worcester, Springfield, Hartford, Meriden, New Haven, Bridgeport, Stamford and Mamaroneck to New York City, a total distance

stop of 45 minutes each day at noon for dinner and a compulsory stop over night at Hartford. The results were figured on a percentage basis of 1,000 points, 100 points for each control. Points were deducted for being either ahead of or behind the schedule time at each control and at the finish.

Geo. M. Sherman finished in sixth position at 5:38, with a leeway of 1 hour and 40 minutes. At 5:41 George Hendee came in 1 hour and 37 minutes ahead of his permissible time. It was nearly half an hour later before Emil Halefinger, finished in eighth place at 6:12, but he had 1 hour and

A. Rand and W. T. Marsh

Joseph I. Russell



M. O'Malley and N. P. Bernard

K. H. Beebe and W. F. Seaman

START OF MOTOR BICYCLE ENDURANCE RUN, BOSTON JULY 4

of 254 miles. The contestants were divided into three classes, according to horsepower, Class A embracing machines of $1\frac{3}{4}$ horsepower, or less; Class B machines of more than $1\frac{3}{4}$ but not exceeding $2\frac{1}{2}$ horsepower and Class C machines of more than $2\frac{1}{2}$ but not exceeding 3 horsepower. In addition to this a time schedule was figured out for each of the different classes, and minimum and maximum time limits were placed on the machines for their arrival at controls. There were ten controls with a compulsory

George Holley reported at the Metropole Club House at 5.18 P. M., Saturday evening, 1 hour 8 minutes inside his maximum time limit and about 5 seconds ahead of M. P. Bernard, who was inside his limit by 41 minutes. O. L. Pickard finished 5 seconds later and 2 hours 1 minute under his limit. L. H. Roberts, who reported only a few seconds later, had 45 minutes to spare. After an interval of 13 minutes W. B. Jameson rolled in at 5.31, inside his limit by 31 minutes. Seven minutes later

5 minutes to spare. F. W. Tuttle came in with him, but was due at 5:58, and was therefore overdue 14 minutes. W. T. Marsh completed the long run in tenth position at 6:33, and was inside his limit by 53 minutes. The last three, however, were all overdue, Joe Downey arriving at 8:38 instead of before 7:26; C. Mankowski at 9 o'clock when he should have been in at 6:39, and Henry Almen coming in last at 9:05, more than $2\frac{1}{2}$ hours late.

The accompanying table summarizes the contest.

Although the run was figured on a basis of 15 miles an hour, the riders were not prohibited from exceeding 20 miles when making up lost time, and many of the contestants admit that they rode even as fast as 30 miles an hour at times.

Thirteen of the starters dropped out before noon the first day, the pace and the hard going having "killed off" the riders, whose stomachs gave out. It rained all night Thursday in Boston and the roads were heavy and slippery with mud, which caused many falls, but there were few breakdowns of machines. It rained again Friday night, making more mud, and Saturday afternoon rain drenched the riders as they approached and entered New York.

Considering these facts the results of the run are remarkable as compared with early

automobile endurance contests in this country and bicycle century runs under similarly adverse conditions. That 13 out of 30 machines should have covered a course of 254 miles within a time limit figured on a basis of 15 miles an hour for fair weather and good roads surely proves that the motor bicycle has reached a state of efficiency where it can be relied upon for the hardest kind of service over long distances. When the mud on the course partially dried, deep ruts were left by the wagon wheels and these caused most of the spills. On the second morning the contestants repeatedly passed persons with ordinary bicycles who were walking.

Rain Responsible for Many Falls

The bad going was responsible for several serious accidents. George V. Rogers, of Racine, had a fall at New Britain that made it necessary to remove him to a hospital there. E. L. Ferguson, of New York, ran into a rut 12 miles out of Worcester on Friday, and lay unconscious for three-quarters of an hour as a result of the fall he got. George M. Hendee, of Springfield, fell fourteen times, but succeeded in finishing in seventh place. Charles Henshaw took a number of headers, which seemed to be the usual form of spill. Only one side fall was reported. C. Monkowski, of New York, who could not find good enough riding between Springfield and Hartford Friday night, and walked most of the 26 miles, tried to ride on a side path, but was so exhausted that he fell over with the machine on top of him. The motor was running but he managed to shut off the spark and escaped with no greater injury than a burned knee and some bruises. W. F. Seaman, of Mineola, L. I., broke a crank right

at the start and rode 80 miles the first day before getting it replaced. Joseph H. Russell, of Hartford, lost a pedal at Thompsonville, and was towed in by another machine, for which he was disqualified. J. M. O'Malley, of Hartford, injured his rear tire at Thompsonville. H. J. Wherett and C. A. Root, Jr., both of Brooklyn, withdrew about five miles from the start owing to accidents. Root was using a chain running over belt pulleys. Henry Allmen, of New York, ran into some obstacle between New Britain and Meriden, and knocked five spokes out of his wheel, besides being badly bruised himself, but continued and finished the run.

The motors in some of the machines were not strong enough to take all the hills with the heavy going, and some of the riders got spectators along the route to push them up.

Pickard and Holley Lead the Way

O. L. Pickard, of San Francisco, mounted on an Indian bicycle, started sixth and led during the early part of the run, reaching Worcester first at 10:41, and Springfield first at 2:52. On the second day, however, George M. Holley, of Bradford, Pa., on a Holley bicycle, set the pace most of the time, reaching New Haven first at 10:41 A. M., and arriving in New York first and so far ahead of his time limit that he sat three-quarters of an hour in Central Park before reporting.

During a large part of the run those riders who came all the way through kept fairly close together. The order and times of arrival at Springfield (100 miles) were as follows: Pickard, 2:52 p. m.; Sherman, 3:11; Holley, 3:15; Roberts, 3:17; Russell, 3:19; Henshaw, 3:26; Jameson, 3:26 and Burnham, 3:41. The order and times of ar-

rival at New Haven (or 166 miles) on the second morning were: Holley, 10:41 a. m.; Pickard, 10:43; Bernard, 10:44; O'Malley, 10:46; Tuttle, 10:47; Sherman, 10:47; Jameson, 10:53; Roberts, 10:54; Hendee, 10:54; Hofelfinger, 11:06; W. T. Marsh, 11:37; Downey, 12:04; Allmen, 12:14.

Of three Indian bicycles started all finished respectively 2 hours, 1 minute; 1 hour 40 minutes and 1 hour 37 minutes ahead of schedule time. The two Orients entered carried their riders through to the finish with 45 and 33 minutes to spare respectively. There were ten Marsh machines in the run, four American Cycle Mfg. Co.'s bicycles and five Mitchells. In all there were nine different makes, counting the Columbia, Cleveland, Rambler and Crescent, all made by the American Cycle Mfg. Co., with the same power equipment, as one make.

Gold medals have been awarded by the Metropole Club to the seven contestants who finished with perfect scores of 1,000 each; blue ribbons were given to W. T. Marsh and F. W. Tuttle, who came within 50 points each of the highest possible score; a red ribbon was awarded to Emil Hafelfinger for earning within 100 points of the best score, and a yellow ribbon was given to Joe Downey for coming within 160 points of the leaders. Bronze medals to commemorate the affair will be given also to the six riders who failed to secure gold medals.

It speaks volumes for the reliability of the motor bicycle that not a single point was lost by any of the survivors because of replacement of any part of the machines.

FRENCH PASSION FOR REFINEMENT

May not the failure of France to achieve substantial success in the building of public-service automobiles be due, in the last analysis, to that characteristic passion of the French for mechanical refinement which forgets the balance between outlay and pecuniary returns in its zeal for niceties of construction which, while they may delight the owner, are little appreciated by his fare-paying patrons? America is not likely soon to rival the French in the construction of racing cars, for the costly refinements by which every superfluous pound of metal is eliminated do not go well with American systems of manufacture; but may not the same racial qualities that go into the production of gasoline and steam runabouts by the thousand, at prices below what would be possible abroad, stand this country in good stead in solving the problems of commercial transport?

EXPORTS OF AUTOMOBILES

Exports of automobiles and parts of the same during the month of May, 1902, were valued at \$148,647. Prior to July, 1901, the Treasury Department included automobiles in "all other carriages" and there are, consequently, no figures to show comparative shipments. Up to and including May, 1902, these exports had reached a valuation of \$817,378.

SUMMARY OF START AND FINISH OF MOTOR BICYCLE RUN

Contestant.	Machine.	H.P.	Starting Finish		Time, July 4, A.M.	Time, July 5, P.M.	Limit, O'clock.	Order of Finish.	Percentage.
			Time.	Time.					
1-Chas. A. Persons, Worcester.....	Royal.	2	8:00						
2-Emil Hafelfinger, New York.....	Royal.	1½	8:01	6:12	7:17	8th		.944	
3-Geo. M. Holley, Bradford, Pa.....	Holley.	2½	8:01	5:18	6:26	1st		1,000	
4-Geo. M. Hendee, Springfield.....	Indian.	1½	8:02	5:41	7:18	7th		1,000	
5-Geo. W. Sherman, Brooklyn.....	Indian.	1½	8:02	5:38	7:18	6th		1,000	
6-O. L. Picard, San Francisco.....	Indian.	1½	8:03	5:18	7:19	3rd		1,000	
7-Geo. V. Rogers, Racine, Wis.....	Mitchell.	2	8:03	Fell and was taken to hospital.					
8-K. H. Beebe, Racine, Wis.....	Mitchell.	2	8:04						
9-W. F. Seaman, Mineola, L. I.....	Mitchell.	1½	8:04	Broke crank off.					
10-Henry Allmen, New York.....	Mitchell.	2	8:05	9:05	6:30	13th		.459	
11-Chas. M. Burnham, Waltham.....	Marsh.	1½	8:05						
12-Harold H. Brown, Boston.....	Marsh.	1½	8:06						
13-F. W. Tuttle, Hartford.....	Cleveland.	2½	8:06	6:12	5:58	9th		.955	
14-J. M. O'Malley, Hartford.....	Rambler.	2½	8:07	Punctured rear tire.					
15-N. P. Bernard, Hartford.....	Crescent.	2½	8:07	5:18	5:50	2nd		1,000	
16-Jos. I. Russell, Hartford.....	Columbia.	2½	8:08	Broke pedal; disqualified.					
17-A. A. Hoyt, Whitman, Mass.....	Marsh.	1½	8:08						
18-A. R. Marsh, Brockton, Mass.....	Marsh.	1½	8:09						
19-W. T. Marsh, Brockton, Mass.....	Marsh.	1½	8:09	6:33	7:26	10th		.994	
20-Joe Downey, Brockton, Mass.....	Marsh.	1½	8:10	8:28	7:26	11th		.872	
21-H. E. Lane, Brockton, Mass.....	Marsh.	1½	8:10						
22-Robert Halsall, Brockton, Mass.....	Marsh.	1½	8:11						
23-G. L. Marsh, Brockton, Mass.....	Marsh.	1½	8:11						
24-L. H. Roberts, Waltham, Mass.....	Orient.	3	8:12	5:18	6:03	4th		1,000	
25-W. B. Jameson, Waltham, Mass.....	Orient.	3	8:12	5:31	6:04	5th		1,000	
26-C. Mankowski, New York.....	Mitchell.	2	8:13	9:00	6:39	12th		.304	
27-Chas. A. Root, Jr., Brooklyn.....	Stratton.	1½	8:13	Withdrew 5 miles out.					
28-Chas. S. Henshaw, Boston.....	Auto-Bi.	1½	8:14						
29-Geo. P. Jenkins, New York.....	Marsh.	1½	8:14						
30-E. L. Ferguson, New York.....	Holley.	2½	8:15	Fell, and knocked unconscious.					
31-N. J. Wherett, Brooklyn.....	Stratton.	2½	8:59	Dropped out near start.					



MARINE MOTOR DEPARTMENT

A LAUNCH FOR SEA CRUISING

The voyage across the Atlantic has been made in very small craft, down to dories of only a dozen feet in length propelled by oars, but in power boats nothing smaller than a complete steam yacht with compound engines, boilers and coal-burning furnaces has thus far made the trip. The New York Kerosene Oil Engine Company, of New York City, proposes to be the first to make the passage in a launch propelled by an explosion motor. The new craft, specially built for this purpose, was launched at the boat shops of the company, at College Point, on June 30. She is 38 ft. over all, with a stem that is nearly plumb, an elliptical counter and a rather low freeboard amidships. A low trunk cabin covers the center of the boat. The motive power is one of the company's 10 h. p. marine motors, in which kerosene is used for fuel, being evaporized in a heated chamber which forms part of the cylinder-head. Tanks are fitted for 800 gallons of kerosene. A jury rig is fitted, a small lug foresail with loose foot and a triangular mizen. The launch was named Abial Abbott Low, after the father of Mayor Seth Low, a noted ship-owner and merchant in the days of the sailing clippers. Her skipper will be Capt. W. C. Newman, a German sailor long in the service of the Low family, accompanied by his son, a boy of fourteen years. The launch will carry water and stores for sixty days, but it is expected that she will make the voyage in about half that time. After a trial on the Sound she sailed from New York on July 9. The kerosene engine is the invention of Feodor C. Hirsch, of New York, an engineer who has had much experience with gasoline and other explosion motors.

A NAVAL RESERVE LAUNCH

The Navy Department has just issued to H Company, Naval Brigade of Massachusetts, of Springfield, a steam launch to be used by the company for practice on the Connecticut River. Lieutenant Dexter, of H Company, has been active in his efforts to secure the launch and has been in communication for some time with the adjutant-general through Captain Weeks, of the Massachusetts brigade. The matter was taken up with the Navy Department through Admiral Bowles, Chief Naval Constructor, and Congressman Gillett also represented to the department the needs of the Springfield company for a power boat. The question at Springfield now is, Where can

the boat be housed, and the suggestion has been offered of quartering the launch in the armory and hauling it to and from the river by wagon. It is, however, probable that the launch will be turned over to Adjutant-General Dalton, of the Massachusetts militia, and then by him to H Company, so that the boat will be under the jurisdiction of the State, and the need of a boathouse made so apparent that the State will erect one.

LAUNCH THIEVES AT WORK

NEW LONDON, Conn., July 7 (Special Correspondence.)—With the boating season at its height the list of accidents—pure and simple and of design—begins to grow, especially among the launches. Recently the theft of boats has come into prominence through the conviction of two young men for looting craft on the Connecticut River. Minor thefts of boat trappings are of course numerous, but the first instance of launch stealing in this vicinity came to light on Friday last when the 22-ft. craft belonging to C. D. Boss, a wealthy New London manufacturer, was taken from her moorings near the Central Vermont Steamship Co.'s wharf. The thieves evidently were familiar with the working of a gasoline motor and made good their escape. The launch was built this year and is valued at \$500. The police were notified and communication opened with all towns along the shore and on Fishers Island and Long Island, so it is believed that the thieves cannot escape with the boat. Nothing has been heard of the boat up to to-day and it is suspected that the launch was run into some secluded place and abandoned.

Three launch accidents happened during the past week in this section, though neither resulted in anything serious. Frank Gaylord and Charles Burnham, of Bridgeport, while on a cruise to New London in a 25-ft. motor boat were blown on to a rock near the mouth of the harbor during a squall and a hole stove in the boat. The men got off in a dingy they had in tow and secured assistance. After making temporary repairs the launch was towed to Norwich, where the launch is being repaired.

In passing under a low railway bridge on the east side of the Thames River on Wednesday evening the launch belonging to the Nameaug Boat Club, of this city, struck a sunken pile and stove a hole in the bottom near her engine. The half dozen men in the boat escaped by climbing on to the bridge while the craft filled. On Thursday evening a launch struck the same pile and was hung up, but escaped without

serious damage. The obstruction has since been removed.

James W. Lathrop, of Mystic, has sold to Commodore Hooker, of the Hartford Yacht Club, a 22-ft. speed launch, which will be used about New London harbor, where Commodore Hooker has a summer home at Eastern Point.

F. N. Isham, of Mystic, has just completed a cabin launch for Thomas Hare, of Boston. The boat is 35 ft. in length and has a 12 h. p. Peerless gasoline motor, also manufactured by Mr. Isham and the first of the size turned out of his works.

The new auxiliary sloop smack Etta and Lena, built by Charles Butson, of Mystic, for a Stonington fisherman, has been fitted with a 9½ h. p. Lathrop motor.

McCreery & Lane, of Mystic, have in frame a 28-ft. seine boat for the Wilcox Fish and Fertilizer Co., of Quiabaug, which will have a Lathrop motor. They also have a contract to build a 28-ft. launch for Barber & Thompson, of Westerly, and an 18-ft. knockabout for Charles Beach, of Hartford. The demand for Mystic-built boats is constant—a reliable indication that the work gives satisfaction.

A NEW TOPEDO BOAT

NEW HAVEN, Conn., July 5 (Special Correspondence.)—One of the great army of men now experimenting with the marine motor in this country is Clarence B. Gillette, a young veteran of the Spanish-American war, at Highland Lake, in the upper part of this State. He is building a torpedo boat for submarine warfare and has the backing of parties who are to bring out his invention. He is not ready to give out any particulars concerning the craft as yet.

The House Committee of the Hartford Y. M. C. A. is arranging with the Standard Oil Co. for the location of a large gasoline tank with a pipe line for launches, to be located at the Hartford station. As the number of launches and auxiliary craft is on the increase, the convenience is one that will be greatly appreciated by voyagers up the tortuous Connecticut River in these boats. At New London the Standard Oil station is near the west end of the big steel drawbridge spanning the Thames River. At New Haven the station is just inside the Tomlinson draw bridge on the east bank of the Quinnipiac River.

It is stated here that James W. Lathrop is unable to keep up with the orders he is receiving for gas engines, even with his increased force of employees and new labor saving machinery. He has just put an engine into a sloop owned by Captain Dickens, of Block Island, and another into a launch owned by H. A. Blossom, of St. Louis. The same day another sloop owned by Captain Dunn, also of Block Island, and also a large whale boat from Newport arrived for that motor. Mr. Lathrop is also putting a

motor into a launch for Prof. J. K. Bucklyn, of Mystic, and three into Noank boats.

An interesting motor trip is being made by the Rev. I. Spencer, of Stamford, and a party of friends in his auxiliary Mystic; a three weeks' cruise to Washington, D. C. The craft has a new five h. p. motor and has been fitted with electric lights. The trip is taken by the way of the Raritan Canal and the Delaware River.

THE NEW TURBINE YACHT

Mention has already been made in THE AUTOMOBILE AND MOTOR REVIEW of the steel yacht built last year by the Gas Engine & Power Co. and Chas. L. Seabury & Co. for experimental purposes in connection with a new turbine engine. The installation of the machinery, which was designed by the owner of the vessel, Charles G. Curtis, of New York, has recently been completed, and she is now in commission. One of her first runs, a couple of weeks ago, was up the Hudson in an informal race with the steam yacht Arrow. On July 3 she fell in with the Sandy Hook steamer Monmouth in the Upper Bay and in a run of some five miles led her and the steam yacht Vamoose. The speed at which the trio were traveling is a matter of doubt, but the Monmouth is recognized as one of the fastest steamers about New York. The new vessel is evidently fast and shows excellent maneuvering qualities. Thus far the secret of her machinery has been well kept by the inventor and it is only known that she has the ordinary outboard equipment of the twin-screw steam yacht, two screws each on its own shaft; and that these screws may be reversed in maneuvering.

THE SCARLET RAMBLER

When Mr. W. G. Jameson, of Dublin, was in New York last year as one of Sir Thomas Lipton's party, he was greatly interested in the new gasoline auxiliary schooners that are becoming quite common here, and on his return he placed an order with Will Fife, Jr., of Fairlee, for a similar craft. This new yacht, the Scarlet Rambler, has just been launched and is now about ready for sea. She is of about 50 ft. waterline and of the American type, with moderate draft, as she will frequent some shallow harbors, and a trunk cabin to give headroom. For the rest, she is a very handsome craft, resembling the other Fife schooners, Geisha and Helen. She has a gasoline motor of 75-h.p. and the exhaust is led to and up through the foremast, which is of steel sheathed with wood. She is rigged as a sailing schooner, with a liberal sail area, the motor being purely auxiliary. Her sails are all of a rich red canvas, harmonizing with her peculiar name. She was built very rapidly, having been launched within little more than a month after her keel was laid; it was intended to have her ready for the Coronation review at Spithead, but owing to delay with the

motor this proved impossible. Mr. Jameson, who has been devoted to racing yachts for the past thirty years, enjoys the reputation of being the best Corinthian racing yachtsman in Great Britain, having contributed largely to the success of the famous yachts Silver Star, Samoena, Irex and Iverna, owned by his cousin, John Jameson. He was also associated with Britannia during her racing days as the representative of her owner, King Edward VII., in the racing. Now that he has taken to the gasoline auxiliary other old yachtsmen are likely to follow.

JAMAICA BAY YACHT CLUB

The Jamaica Bay Yacht Club held a very successful regatta on July 4 with 39 yachts competing, including two classes of launches. In the 25 ft. class the times were: Grace, 1:29.26; Arvilla, 1:32.50; Wave, 1:49.31; Adele, 1:55.31. In the 20-ft. class the times were: Americus, 37.48; Anna M., 43.17; Whip, 44.30.

OIL FUEL FOR STEAMERS

An important test of oil as a fuel for steamships on long routes is now being made on the steamer Mariposa, running between San Francisco and Honolulu. This vessel, with engines of 3,500 h. p. has been fitted with tanks carrying crude oil, her coal bunkers having been removed. She will probably sail from San Francisco this week, having on board Chief Engineer H. N. Stevens, U. S. A., who has been relieved of duty as inspector of machinery at the Union Iron Works and specially detailed to the task of reporting on the trip to the navy department. While the subject of the economic substitution of oil for coal is an important one the world over, it is especially so on the Pacific Coast, where coal is scarce and dear and crude oil is cheap and plenty. The incidental advantages of oil, its easy storage and supply and the absence of dust and ashes, make it more desirable than coal for large and small vessels alike.

A LAUNCH RACE AT NORTHPORT

The Independent Yacht and Boat Club, of Northport, Long Island, held a race on July 4 in which two classes of launches competed. The times in the 22-ft. class were: Ruth, 28.18; Puff, 28.27; Alice, 29.00; Dolly Varden, 29.36. In the 17-ft. class the times were: Thelma, 20.21; Emma, 22.10; White Star, 22.13; Edith, 22.19. Dolly Varden protested Ruth for fouling.

The L. J. Wing Mfg. Co., of New York, has united with the Norwalk Pattern and Manufacturing Co., of South Norwalk, Conn., the new company, with a capital of \$100,000, being known as the Colonial Foundry and Machinery Co., Incorporated. The present works of the company, on a plot 500 ft. of frontage on the N. Y., N. H. & H. R. R., and 250 ft. on the Norwalk River, will be enlarged for the erection of a new machine and pattern shops and the enlarge-

ment of the foundry to three times the present capacity. The company will build the Wing disk fans, blowers, heaters, steam engines, gas engines, acetylene gas generators, air compressors and other machinery, in addition to general foundry and machine work. The officers are: President, Wm. N. Brewer; secretary and treasurer, L. J. Wing; general manager, C. H. Aisthorpe; assistant manager, N. Hatchman. The New York office is at 251-253 West Broadway, New York.

An auxiliary dory of the salt-water type is now building on Lake Winnisquam, at Laconia, N. H., by R. F. Foss for his brother, F. V. Foss, of Lynn, Mass. The Lettie E., as she is named, is 32 ft. over all and 8 ft. wide, with about 2 ft. 6 ins. draft. She will be fitted with a Foss gasoline motor of 6 h.p., with a dynamo for ignition and lighting. She will have a canopy top with side curtains, inclosing her in bad weather. When completed she will be shipped by rail to Dover, and from that point will make the run to Lynn.

A runaway of a gasoline launch is reported from the St. Lawrence River, near Alexandria Bay. The launch was made fast alongside a scow to tow the latter, and the launchman, after first starting the launch, jumped aboard the scow and took the tiller. The lines slipped in some way, and the launch ran away so quickly that the man was left on board the scow. The runaway was finally caught by a man, who put in a claim of \$500 for salvage.

The Eastern Mfg. Co., at South Brewer, Me., is busy with a steam yacht for F. W. Ayer, of Bangor. She will be of wood, 104 ft. over all, 17 ft. wide and 10 ft. deep. The engines, designed by C. B. Clark, superintendent of the company, and built in the company's shops, are triple expansion, with cylinders 8, 12 and 20 by 10 ins. The forward deckhouse is fitted as a dining room. The yacht will be in charge of Capt. John Lord.

The 30-ft. gasoline launch Bouboulina, recently built for the Greek consul at Boston, started from that port for Sullivan, Me., where her owner has a summer home. When off York Beach her motor stopped, and she drifted out to sea. Some hours later she was picked up by a coasting schooner and towed into Bangor.

A twin-screw cruising yacht of shoal draft, with a steel hull, is now being built for his own use by J. J. Hoppes, of the Hoppes Manufacturing Co., Springfield, Ohio, the work being done at the company's shops. Mr. Hoppes, who is in poor health, will make a long cruise later in the summer, accompanied by his family. The yacht will be 75 ft. over all by 16 ft. width, with two Wolverine motors of 30 h. p. each, which will be installed at the Wolverine works, Holland, Mich.



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OUR ROADS AS THEY ARE

The optimistic views that have been prevalent of late of the present condition and future progress of American roads have received a decided set-back this week by the news from the West. Not only has the Chicago Automobile Club been compelled to announce the postponement of its endurance contest on account of roads which are unfit to travel, but a Chicago motorist, who started from that city in a new and powerful touring car for a trip to Boston, has been compelled to abandon his route at Cleveland on account of bad roads. To those familiar with the miles of at least passable and practicable roads in the East, in the vicinity of and in a measure uniting such cities as Philadelphia, New York and Boston, it may seem strange that an event which was arranged with so much care and in which so many were deeply interested should be abandoned on account of mud; but those who know the roads of Illinois and Indiana will realize the wisdom of the postponement. In continued dry weather these dirt roads, though dusty, are at least hard, smooth and fairly easy to ride over, but in wet weather they are cut into ruts deep with thick pasty mud. Bad as they are in this condition, the first spell of dry weather makes them even worse—for the motor vehicle—as the mud dries in hard ridges that make all riding difficult and unpleasant, and are fatal to tires. It is these conditions, of abundant mud or sharp hard ridges, which have served to deter the motorists of Chicago. The weather for some time past has been rainy, and even a change

during the present week would only serve to make matters worse.

The roads which have thus signally failed are in no remote sections, but are the main highways uniting Chicago with Milwaukee on the north, and Toledo and Cleveland on the east. That they are so bad as to be practically impassable argues poorly for the average road throughout the country at large. As long as such roads continue to exist a contest such as has lately been suggested in good faith, an endurance run from New York to Chicago, is a manifest impossibility. Given favorable weather, there are plenty of cars that are fully capable of making the trip; but the general conditions are not such as to warrant an experiment of this nature at the present time. In the event of moderately bad weather the unsatisfactory experience of last year on the run to Buffalo would be repeated on a larger scale; and even with good weather it is probable that a majority of vehicles would make a showing which would be neither creditable or encouraging.

There is no longer any question of the real ability of the motor vehicle, of the speed, power and endurance of the best machines in the hands of experts. What is now needed to secure the full confidence of the public is a series of satisfactory demonstrations of the capabilities of a representative number of average vehicles handled by the average driver. No real good can come from long and severe tests in which the odds are in favor of a failure; and as American roads are to-day all long distance races over straightaway courses must fall in this category. It is possible to lay out a course of say 500 miles in the East that will offer a fair test of vehicles and prove of some practical value, but the time has not yet come for a contest of a large field of vehicles between New York and Chicago.

The subject of a trans-continental highway, lately revived, is closely connected with this public announcement of the true condition of the roads of the middle West. Until the average standard of road-making in each State is raised far above its present level there can be little hope of the realization of this beautiful scheme. It is, of course, easily within the limits of national financing and engineering to start at New York and build a model road west for three thousand miles, but there is little likelihood of the road ever being completed in this matter. If the idea is ever realized it will be as an essential part, if not the culmination of a general system of road improvement in which all the States will participate.

THE ENDURANCE OF MOTOR CYCLES

The Boston to New York endurance contest, run on July 4 and 5 by the Metropole Cycling Club of New York, has done a great deal to prove the efficiency of the motor bicycle. A comparison of the results of the first endurance contest for the small-powered, two-wheeled gasoline vehicle over a distance of 254 miles, with similar contests

for three and four-wheeled automobiles previous to 1902, reveals the motor bicycle in an excellent light.

In the motor bicycle run, despite frequent rain and muddy roads, 13 out of 31 starters finished. Ten of them within the time limit figured on a basis of a minimum of 8 miles for the low-powered machines, 10 miles for those of medium power, and 12 miles for the high-powered bicycles. Several of the finishers reported very close to the 15-mile maximum time limit. Seven of the 31 starters finished the long and difficult run with perfect scores of 1,000, while not one of the 13 finishers lost any points on account of penalized trouble with his machine.

In the Long Island 100-mile endurance run in April, 1901, 10 out of 15 starters finished, but only two made a perfect score of 100 per cent. and two others made scores of more than 99 per cent. The weather conditions were very bad but the roads were well macadamized.

In the endurance contest of the Automobile Club of America, from New York to Rochester, a distance of 390 miles, run in September, 1901, 42 out of 80 starters completed the run, and 20 won first class certificates for scores of 100 per cent. There were 7 motor bicycles in that event, and not one of them finished, all but two quitting at or before Albany. The average time made by the blue ribbon winners was slightly more than 13 miles.

In one of the earliest motor vehicle contests in this country, that from New York to Ardsley in May, 1895, over a distance of 30 miles, only 3 out of 8 starters finished, although the roads and weather were excellent.

This time it is *The Times*, in its brand-new automobile department, which has discovered it—the poor man's automobile. We learn from the Sunday *Times* that it is probable that a reduction of prices may be looked for next spring, or even this fall, and that "in two or three years it should be possible to buy any popular form of motor vehicle at about half the present prices. A small, light gasoline runabout for two persons should not cost more than \$300 or \$350, instead of \$650 to \$700, as at present, and a touring car for four persons should sell at the present price of the runabout or less."

Perhaps if *The Times* had just a little practical knowledge of motor vehicles, even though it were no less prejudiced against them, it might not make quite so many absurd and extravagant blunders in discussing them editorially.

E. G. Walton, of Minneapolis, is the first to adopt the motor vehicle for showing real estate to prospective customers. He has a large suburban business, and has arranged to meet his customers at certain hours, when he will take the parties out in the vehicle to look at the land.



CLEVELAND EXPANSIONS

The F. B. Stearns Co. Contemplates Another Factory Addition Winton Company Will Soon Move—A. & C. P. Co.'s Plans

CLEVELAND, Ohio, July 7. (Special Correspondence.)—The F. B. Stearns Co. is already making preparations for another season. Contracts for 1903 are being closed with several leading agents and plans are being made for another addition to the factory, which is expected to more than double the capacity of the plant. Only very recently the company completed an addition of considerable size, and the latest step indicates clearly that the company purposes to be in the front rank another season. Trouble in securing material has held the company back considerably of late, but it has managed to ship two or three machines each week.

Gear Business Requires Larger Facilities

The Automobile & Cycle Parts Co. is making a number of changes in its factory arrangements. It is expected that when matters are settled one of the factories will be used almost exclusively for the production of automobile running gears. An order for 350 sets of its gears is well under way for Studebaker Bros., of South Bend, Ind., as is also an order for 100 sets for A. L. Moore's new company. Several other concerns have also placed orders, ranging from 25 to 100 sets.

Winton Company to Move Soon

It is now only a matter of a few weeks before the Winton Motor Carriage Co. will be moving from its birthplace in the old Brush plant to the fine group of buildings which looms up to the view of every one who comes into the city from the West along the lake shore. Four large buildings are nearly completed and others under construction form a row of structures facing the railroad tracks for a distance of nearly a quarter of a mile. Unquestionably, when complete this plant will be the largest of its kind in the country, if not in the world.

A NEW BUFFALO ENTERPRISE

D. C. McCan Leases a Plant and Prepares to Begin the Manufacture of a New Type of Vehicle—Gasoline and Electric Power

BUFFALO, N. Y., July 7 (Special Correspondence.)—D. C. McCan, who hails from France and who has been in Buffalo for some time seeking suitable quarters in which to establish a motor vehicle manufacturing plant, has leased the two-story building at 58 to 62 Broadway and the work of altering the interior is well under way.

Concrete flooring is being laid on the entire ground floor, and other alterations are to be made which promise to make it one of the most up-to-date plants in the city. Contracts for the machinery have been let and the work of installing it will proceed as soon as the floors are ready to receive it. It is expected that the plant will be in full operation in a month or six weeks.

The vehicles to be built by Mr. McCan will follow French patterns and, while not being cumbersome, will be especially constructed with a view to serviceability and durability on all sorts of roads. Most of the machines will be driven by gasoline motors, but in some the gasoline motor, of 5-h.p., will be supplemented by an electric motor of 5-h. p.

W. S. McGinnis, an attache of the Postmaster General's office, is in Buffalo collecting data of the different makes of motor vehicles, with a view, it is said, of using them for the collection and delivery of the mails in suburban districts of this and other cities. A number of the locally made vehicles are being tried on the roads about the city.

LIVELY BUSINESS IN TOLEDO

Many Out-of-Town People Buy from City Dealers—First Batch of Twenty-Five Toledo Gasoline Touring Cars Nearly Ready

TOLEDO, July 5. (Special Correspondence.)—June business far exceeded the most sanguine expectations of the local dealers. A noticeable thing in connection with the trade is the number of machines that are being sold to residents of nearby towns and even in places considerably distant. The reason is probably that few of the smaller cities and towns have automobile stores and where there is one, no stock is carried.

The Toledo Motor Carriage Co. had the agency for the Oldsmobile last fall, but this summer it was given to Wilson & Levy, who came here from Cleveland and opened a store. They have been doing a very good business. The Toledo Motor Carriage Co. felt aggrieved by this move on the part of the firm that controls the sale of the Oldsmobile in Ohio and in a number of instances has secured Oldsmobiles from some place unknown to others and sold them to customers. It had two this week and expects a carload more in a few days. It is said that when the manufacturers discover where the machines come from they will cut off the supply to the party that is furnishing them.

The Toledo factory of the International Motor Car Co. is working day and night,

with 350 men on the pay roll. Every energy is being strained to put through 25 of the new gasoline touring cars. The first one will be completed in a day or so and will be shipped to Chicago. It was given a trial run a few days ago in an unfinished state and the result was very satisfactory.

The company is also very busy on steam carriages of the dos-a-dos type and is turning them out in considerable numbers. It is also intended to build a smaller gasoline machine with about 11-h.p. and experiments along that line are being made now.

May Take Pierce Agency

Wm. Culverson, representing the Geo. N. Pierce Co., of Buffalo, was in the city during the week showing one of that company's gasoline motorettes. It is probable that the Toledo Motor Carriage Co. will take the agency.

STEAM VEHICLE CO. ATTACHED

Manufacturers of the Reading Carriages Attached on Note for \$15,000—Previous Petition in Bankruptcy—Factory Closed

The Steam Vehicle Co. of America was served on July 3 with a writ of attachment for \$15,000 issued in favor of George S. Edgell and Austin Corbin, doing business as the Corbin Banking Co., on a note of the defendant dated August 13, 1901, and payable on demand. A petition in involuntary bankruptcy was filed against the company in Reading, Pa., where the company's factory is located, nearly a month ago. No definite information could be received at that time from President Arthur Schwarzenback, of the company, further than that the petition was filed by one of the creditors and that he believed the factory was closed for the present. The attachment for \$15,000 was granted on the grounds that the company is a New Jersey corporation. It was incorporated on March 22, 1900, with \$250,000 capital stock. Geo. A. Lamb is treasurer. The general office of the company is at 52 W 43d St., New York. The company manufactured the Reading steam carriages.

NEW ENTERPRISE IN TONAWANDA

The Towanda Motor Vehicle Co. was formally organized in Tonawanda, Pa., last month by the election of the following board of directors and officers: George W. Kipp, of Puxsawney, president; E. F. Kizer, vice-president; N. N. Betts, J. A. Hill, Chas. A. Lindstrom, C. T. Kirby and B. W. Jennings. This company will manufacture electric vehicles in Tonawanda, under the patents and designs of Charles A. Lindstrom, of Buffalo, and formerly of the Hewitt-Lindstrom Co., of Chicago. Edward Winkes, of Buffalo, will be the general foreman in charge. The company is capitalized at \$25,000.

The brick factory building on Plank Road St., which the company will occupy, is being put in readiness for the commence-

ment of work. A new boiler has been installed and a complete outfit of machinery and tools for the shop has been shipped. It will probably be two months before everything is ready for business, and in the meantime five carriages are being built in Buffalo.

A \$5,000,000 BOSTON CONCERN

The Engineering Co. of America has been incorporated under the laws of New Jersey with \$5,000,000 capital stock, to take over the Cunningham Engineering Co., of Boston, Mass., capitalized at \$100,000, and engage in the manufacture of heavy steam trucks, of two tons weight and over, the development of transportation companies in different cities and the construction of apparatus for electric cars. The officers and directors of the new company are as follows: President, Albah Trowbridge, of New York, ex-president of the North American Trust Co.; vice-president, Chas. P. Smith, of Fitchburg; secretary and treasurer, Fred D. Stanley; directors, James D. Livingston, New York, vice-president Trust Co. of the Republic; Marshall D. Barr, of the Stanley Electric Mfg. Co., New York; D. C. Fiske, Worcester; Henry A. Belcher, Boston; H. L. Herbert, New York, and Charles B. Duffy, of Worcester. The stock of the company is divided into \$2,000,000 6 per cent. non-cumulative preferred and \$3,000,000 common.

The Rochester Carting Co., of Rochester, N. Y., has just received two big electric trucks built by the Vehicle Equipment Co., of Brooklyn, N. Y., to be used in heavy transfer work. One, which has a capacity of five tons, is to be used for moving big safes, machinery and other heavy objects. It has three 4-h.p. motors, two of which are used for propulsion and the other for operating a windlass for hoisting purposes. The battery consists of 44 oxide cells. The wheels are fitted with solid rubber tires, 6 in. wide on the rear wheels and 5 in. wide on the forward wheels. The other truck is of 3-ton capacity, and is similar to the large one except in the matter of size. It has three motors of the same power, however, and will travel at greater speed.

Mr. Frederick J. Newman, of Pittsburg, Pa., is now in business in the Lewis Building, Sixth and Smithfield Sts., in that city, as consulting engineer and automobile expert. Mr. Newman is prepared to give advice in all matters relating to steam and gasoline engineering and motor vehicles, as well as to design and test engines and cars.

Twenty-five bodies have just come through the New York Custom House for use on the Pan-American machines in course of construction at the Mamaroneck factory of Albert C. Bostwick and B. B. McGregor. The bodies are from Clement & Rothschild, Paris. All other parts of the vehicles including the motors are made in this country after designs by Mr. Bostwick.



ENDURANCE RUN POSTPONED

The Chicago Automobile Club Changes Date of Its 100-Mile Run to August 2, Owing to Excessive Rains and Dirt Roads

CHICAGO, Ill., July 7. (Bureau Correspondence). At a meeting of the board of governors of the Chicago Automobile Club held to-day, the following resolution was adopted:

"Resolved, That on account of the extraordinary weather of the last month, it would be unfair to make a 100-mile test under the conditions imposed by the rules, and that the 100-mile endurance contest be postponed until Saturday, August 2, and the date of the receipt of entries be extended until Monday, July 28."

This course was deemed advisable owing to the fact that a great part of the course is over dirt roads, which are good in dry weather but rough after rainy weather, and would be hard on tires. The rains have been almost constant throughout June and thus far in July. The club desires to give the vehicles a fair chance and to avoid an undue amount of tire troubles.

AUTOMOBILE CLUB OF TRENTON

The Automobile Club of Trenton has just been organized in Trenton, N. J., with officers as follows: President, Karl G. Roebeling; vice-president, John S. Broughton; secretary, Edward S. Wood; treasurer, George Buckman. There are about twenty-six automobiles in use in Trenton now, and there is every indication of the numbers being materially increased during the summer and fall.

CLUB PRESIDENT IN EARNEST

CLEVELAND, O., July 7. (Special Correspondence).—A few days ago E. Shreiber Reese, president of the Cleveland Automobile Club, claims to have seen Superintendent Moers, of the Peerless Mfg. Co., making somewhere near the speed limit of a Peerless touring car in the heart of the city. Like the good official that he is, Mr. Reese immediately swore out a warrant for the arrest of the offender. The paper has not yet been served, for the reason, it developed, that Mr. Moers when last seen was trying to catch a train for Philadelphia.

KANSAS CITY HAS A CLUB

The Automobile Club of Kansas City was permanently organized at a meeting of motor vehicle dealers held on the night of June 28. Officers were elected as follows: President, D. F. Diazek; vice-president,

J. W. Wittman; secretary, W. L. De La Fontaine; treasurer, E. P. Moriarty. One of the first acts of the new club was to plan a 100-mile endurance run for July 8, open to all. Eight entries were made immediately, and it was expected there would be at least 20 before the entry list closed. The object of the club is to promote interest in motoring. Efforts will be made to recruit members from among all local owners of motor vehicles.

An injunction to restrain further work on the construction of the new club house for the Arverne Automobile Club is being sought by residents of Arverne, Long Island. Objection to the club house is based upon the fact that the plans call for a storage room with a capacity for 100 vehicles, while the property at Meredith Ave. and the Boulevard, on which the structure is building, is held under restrictions that none of it shall be used either for stables or stores. It is maintained that a storage place for automobiles will make the club house a stable. The site is in the heart of the finest residence section of the town.

Under the auspices of the Automobile Club, of San Jose, a score or more San Francisco and Oakland members of the Automobile Club of California intended to join the former club members in a run last Sunday to the Mission San Jose.

The City Park Board in Denver, Col., in a resolution passed at a recent meeting and afterward issued to the public, threatens to exclude all automobiles from the park owing to reports of an accident alleged to have been caused by two racing motorists, and also to frequent complaints regarding fast driving of the machines in the park, which the police force is inadequate to suppress.

Col. Max Fleischmann, of Cincinnati, brother of Mayor Julius Fleischmann, proposed to start on July 8 on a trip from Cincinnati to New York over the Allegheny Mountain route in a 12-h.p. gasoline machine, which he has been driving in the streets of Cincinnati for some months. He was to be accompanied by his chauffeur, an expert mechanic. The proposed route has never been traveled by an automobile.

Within a short time after the new license ordinance went into effect in Cleveland, O., the city clerk's office had issued 273 automobile licenses of which 137 were for gasoline vehicles, 91 for steam and 45 for electric.

Foreign Topics

ENGLISH NOTES

The King's Illness—New British Racing Cars—The Dust Nuisance on British Roads, Its Cause and Extent

LONDON, June 28. (Special Correspondence.)—Automobile matters have been very largely overshadowed of late, first by the preparations for the coronation, and secondly by the lamentable change in the king's health, which, at the eleventh hour, necessitated the indefinite postponement of the august ceremony. Practically speaking it gave us two blank days, so that the only resource was the automobile and departure for the country and the sea. The great Gordon-Bennett and Paris-Vienna races, which otherwise would have held a most prominent position in every one's mind, are overshadowed indeed by the calamity that has befallen us, but I note by my French papers this morning that although Rene de Knyff was through first to Belfort, C. A. Jarrott, the English crack, but driving a Panhard, was less than half an hour behind him at Belfast, where the first racing stage ceased and the crawl through Switzerland began. S. F. Edge, driving the new and untried 40-h.p. gear-driven Napier weighing 16 cwt., was just two hours in the rear of the first man, so there is as yet no necessity to despair of the ultimate success of this finely constructed vehicle. Before this car was shipped to France, she had only been out once upon the road, and then in an uncompleted condition. I believe I am within the mark when I say that Edge had never driven it at all until he mounted it at Paris. To run untried vehicles in this way is, of course, to court failure, but what will you—the Napier works are full to overflowing with orders, and crack racing craft of this description are, after all, but a reclame. Still, with all the above mentioned disadvantages thrown in, the new Napier, our only representative in the race, is well up at the time of writing.

Dry Weather and Dust

During the last few days, automobilists and road wayfarers on roads that automobilists most affect have suffered, the first sensibly and the latter sorely, from the dust nuisance. Our flint roads powder on the surface to a terrible extent in some parts; and the cloud, dense and overhanging, which a fast car leaves behind it when running at any speed over such surfaces must be seen to be believed. The dust problem in connection with automobiles is one that cries aloud for a solution, and it is one that all the world would be pleased to see tackled by American ingenuity. Fool remedies we have had by the score, but no single device as yet which in any way protects

the foot passenger or other user of the road from the gritty pall. The provoking causes are apparent to the most casual observer, and are as follows: 1. The dust on the road; 2. High speed, say anything over 15 miles; 3. Small wheels, 28-in.-30-in.; 4. Large diameter of the pneumatic tires used, from 3 to 5 ins.; 5. The close approach of crank chamber, fly-wheel, gear-box, silencer and water-tanks to the surface of the road, which concentrates the rush of air below the vehicle and throws high and abroad the dust squelched out by the big tires. And, sixthly, there is the particularly thoughtless manner in which makers arrange for the issue of the exhaust from the silencer, many of them turning it down on to the ground beneath the car, so that it is largely accessory to the nuisance under discussion. If the running of a petrol car and a locomobile or steam car of similar type thereto, is compared at equal speeds over the same dusty section, and presuming both vehicles are shod with equal size of tires, it will be noted that the petrol car leaves behind it a cloud of dust at least four times as great and as disagreeable as the steamer, and there is no doubt whatever that the immunity or comparative immunity of the latter is largely due to the clear run beneath the body and the height of the floor above the ground. Meanwhile, owing to the necessities of weight, the cost of tires, double tube tires and the general design of petrol cars as they are preferred on this side, nothing can be hoped for by alteration in design. What is wanted is some device, a screen, deflectors or something else, which shall abate the nuisance, for a nuisance it most undoubtedly is. Glass screens, and blinds to Limousine tops will save the automobilists themselves much annoyance, but do nothing for the other road users, who at all times and most particularly in dusty weather, curse automobiles by all their gods. Here, then, is a field open to American genius, which nothing daunts, and should it provide a panacea for the evil the present scribe, for one, would be profoundly grateful.

More New Motors

Nothing has been heard of late of the rotary petrol motor, which was in course of construction by Lieut. Gaysdon, late of the U. S. Navy. It was said that he was perfectly confident of building a motor of this description which would be equal in every way to his ingenious rotary steam engine, which also now seems to halt in coming to the front. A really practical rotary petrol motor would upset present automobile practice to a terrible degree, but if quite reliable would undoubtedly advance the automobile

movement by leaps and bounds in this country, where the uninitiated still talk of the smell, noise and vibration whenever they desire to run down the new mode of road locomotion. In the meantime I hear that a firm of engine builders have a compound petrol motor in course of construction. It will have two high pressure and one low pressure cylinders, and the exhaust will leave the latter at very little above atmospheric pressure. If this turns up trumps there is sure to be a big run on such an engine, for it will be susceptible of perfect balancing and will run with little or no noise.

The Reliability Trials

With regard to the 650 miles reliability trials set down for the month of September by the Automobile Club of G. B. and I., these, I fear, may be interfered with by the coronation, which, if His Majesty the King, progresses as we all hope and pray he may, will be set down for that month. However, we shall see what we shall see, and everything just now is upon the rules of the gods.

MOTOR NEWS FROM GERMANY

In proper recognition of a serious want the Frankfort Motor Car Club nominated several members for the purpose of erecting benzine stations in the town itself, as well as in the environment; and in a very short time no less than sixty such stations were fitted up by chemist stores, inns and different shopkeepers, who all expect, and may be assured of, a good return for their outlay. The above is the club founded by Herr Mueller-Herfurth on his retiring from the Frankfort Automobile Club in consequence of differences with other members of the board.

General regulations for motor driving in the Kingdom of Bavaria have been published in the official journal; they resemble those of the Prussian government, the maximum speed in cities or villages being 12 kilometers per hour. A new and striking feature of the new set of laws is the paragraph entitling the head officials of all Bavarian districts to examine such cars as, according to their belief, do not thoroughly conform with the rules laid down by the powers that be.

The Silesian A. C. has published the proposition of its projected Breslau to Vienna tour, open to all motor vehicles bar such for racing purposes. The start is fixed for June 25, and the first stage leads to Habelschwerdt, a distance of 107 kilometers from Breslau. On the 26th the journey will be continued to Brunn, 149 kilometers, and on Saturday, June 27, Kollenbrunn, the last stage of the tour will be attained.

The recent criterium of alcohol in France showed once more that Germany has no need to hide itself in any industrial sense, as Maurice Farman used Continental tires on the victorious car in the "heavies" divi-

sion, the second vehicle also being shod with the like tires, while the first two winners in the light car division careered home on Continentals as well.

The Konigsberg motor exhibition has been postponed, according to a circular notification of the committee, till next spring.

The annual meeting of the Swiss A. C. went off very quietly in Basle, the vice-president, M. Empeyta, being in the chair. Owing to the state of the weather, the procession of cars down on the programme could not take place, but numerous visitors at the congress went over to Alsace to test the roads there.

No less than 12,000 invitations have been sent out by the promoters of the Leipzig show in October next, the manufacturers of and dealers in sewing and typewriting machines being included in the list, as the Leipzig committee wish to make their show a thoroughly representative one.

The members of the diplomatic corps in Berne have been exempted from payment of any fees for such motor vehicles as are in their possession. The reason for this somewhat unusual step can be attributed, as the wording of the notification has it, to "international politeness."

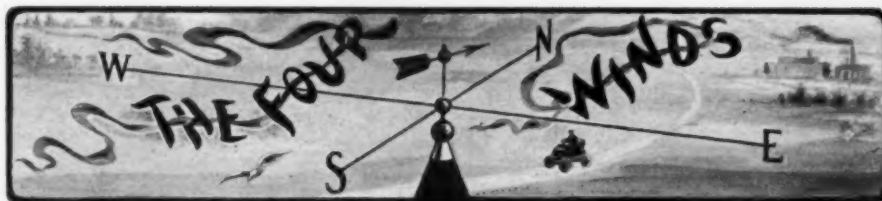
Among the visitors to the Berlin show was the Postmaster-General of Prussia, who paid great attention to the exhibits, which were minutely inspected by him, with a view to increasing the number of motor vehicles now in use by the postal employees.

A society of motor mechanics has been founded in Geneva to guard over the interests of such chauffeurs as become members, and to enable the proprietors of cars to hire a skilled, trustworthy driver.

The Frankfort A. C. is arranging a race meeting on the Oberforsthaus track at Frankfort for August 31, and trusts to see foreign automobilists assemble as well as the pick of the home talent. It was here that the first track races in Germany took place.

The Bavaria A. C. is planning an extensive tour throughout Germany for the summer of 1903, and the whole of the German automobile societies are to be invited to participate in the trip, with Leipzig as the general meeting place, and presumably Munich as the goal of the tourists. The number of prizes to be given will be in proportion to the entries received, and the promoters are endeavoring to interest agriculturists and army officials in their undertaking.

As the Austrian Minister of War is so greatly in favor of motor vehicles for the army, several officers of different regiments are now undergoing a course of instruction as chauffeurs in leading motor factories, and in the coming maneuvers cars of various types will be submitted to severe trials by these trained gentlemen-chauffeurs.



BRIDGEPORT ENDURANCE RUN

All Fourteen Contestants Finish 50-Mile Test Without Penalized Stops but Many Exceed Time Limit and Are Disqualified

BRIDGEPORT, Conn., July 5.—The 50-mile endurance run of the Automobile Club of Bridgeport, held yesterday, was a great success, with the exception that road and weather conditions were too good, and the operators had such difficulty in holding the speed of their machines down to the legal and club limit of 14 miles in the open sections and 8 miles in towns, that a number have been disqualified and others are almost sure to be before the official report is published.

Aside from this unsatisfactory feature, every machine of the fourteen that started covered the entire course without accident or breakdown and returned to the starting point in Bridgeport not more than half an hour outside of the minimum time limit. With but few exceptions the turn in Mianus at the 25-mile point was reached exactly on or slightly ahead of time, and at least half of the contestants finished within 45 seconds of the allowed time.

Time Limit Makes Trouble

Five operators were disqualified for reaching the turning point ahead of time. The limit of 1h. 47m. for the outward run resulted in an interesting spectacle on Richmond Hill, on the outskirts of Stamford. With the turning point in view, perhaps half a mile away, the operators of the machines began calculating time, and, finding that they had arrived dangerously close to the turn from 12 to 20 minutes too soon, resorted to various tactics to consume the time. The slow speed gears were thrown in on the gasoline machines and there was a long line of vehicles taking a zig-zag course up the road toward the turn. To further

kill time, some circled around several times just before starting on the return trip. Checkers at the Mianus turn assert that all but four of the contestants arrived ahead of time. These four were G. S. Bryan, G. W. Hills, C. Barnum Seeley and J. B. Cornwall. As the rules prohibited detours, there may be further disqualifications. The committee on the runs and tours, consisting of G. S. Bryan, J. B. Cornwall and Bernard Setzer, has the observers' cards under advisement and will probably render an official report at the regular monthly meeting of the club on Monday night. There has been some talk of holding the run over again, but as this would be hardly fair to those who conformed strictly to all rules, it is thought that the medals offered by Jonathan Godfrey and the first, second and third certificates will be awarded to the four or more and that another run will be promoted for Labor Day in September.

No Penalized Stops

It is a matter of satisfaction to the club that none of the disqualifications was for trouble with the machine. In no case was a penalized stop or disability of the machine reported by the observer. Most of the gasoline machines made the fifty miles without a stop, although permitted to stop once for gasoline and to oil the machines.

The accompanying table tells the story of the contest briefly and as accurately as possible pending the decisions of the committee.

ALDERMAN PALMER ABANDONS TRIP

Honore Palmer, Chicago's youngest alderman, member of the Chicago Automobile Club and son of Potter Palmer, who left Chicago at 10 o'clock on June 26 in a 20-h.p. Robinson touring car for an overland trip to Boston, abandoned his trip at Cleve-

UNOFFICIAL TABLE OF RESULTS OF BRIDGEPORT CLUB'S ENDURANCE TEST.

Entrant.	Vehicle.	Start. Finish. Running			Observations.
		A.M.	P.M.	Time.	
1—W. S. Teel, Jr.....	Locomobile.	9:00	1:04	3:34	Stopped 30 min. for water at Stamford.
2—C. Barnum Seeley....	Mors.	9:14	12:53	3:39	No stops.
3—M. V. Doud.....	Locomobile.	....	....	....	Disqualified.
4—Arch'd McNeil, Jr....	Locosurrey.	9:03	12:57	3:34	Stopped 20 min. between Stamford and Mianus.
5—Fred Letting.....	Locomobile.	....	....	....	Disqualified.
6—F. W. Bolande.....	Long Distance.	9:05	12:39	3:34	Stopped 30 min. for water at Stamford.
7—J. B. Lyford.....	Locomobile.	9:05	12:55	3:34	Three stops for water and gasoline.
8—Charles Gilbert.....	Locomobile.	....	....	....	Disqualified.
9—Jonathan Godfrey....	Peerless.	9:08	12:42	3:34	No stops.
10—George W. Hills....	Oldsmobile.	9:09	12:44	3:35	No stops.
11—L. B. Curtis.....	Winton.	....	....	....	Disqualified.
12—S. D. Locke.....	Packard.	....	....	....	Disqualified.
13—J. B. Cornwall.....	DeDion-Bouton.	9:12	12:58	3:34	Stopped 3 min. to oil at Stamford.
14—Gregory S. Bryan....	DeDion-Bouton.	9:13	1:00	3:34	Stopped 13 min. to oil at Stamford.

land one week later and took a Pullman back to Chipago. The Grey Wolf he sent forward to Boston in charge of his expert machinist. His original purpose was not defeated by the machine; he met his Waterloo in our American roads, made unconquerable by old Neptune.

The first night Mr. Palmer, with his machinist, reached La Porte, Ind., 70 miles; on the second they covered 104 miles and stopped at Kendallville, despite some rain and the bad condition of the roads. On the third day there were almost incessant deluges of rain and after ten hours of traveling, with mud frequently up to the hubs, the adventurers had covered but 36 miles. When they struck particularly bad stretches, the machine would come to a stop, then they would back up and sending the machine ahead at full speed, make about a dozen yards, and halt again, only to repeat the maneuver. Once, upon turning to one side, upon what appeared to be better ground, the machine went in over the hubs, and the aid of a man with a spade had to be secured to dig it out. The roads were of clay, which in dry weather makes a good surface, but in wet weather is as nearly impassable as a road can be. Horses could not have done as well as the machine did, Mr. Palmer thinks.

Toledo was reached on Monday, June 30, and the lake shore was followed from there to Cleveland, where the mud covered outfit arrived on July 3rd.

Alderman Palmer has become a good roads advocate. He thinks the national government, the states and the counties should all be actively engaged in improving the highways.

THE PHILADELPHIA ORDINANCE

Effect of the Control Tests Is Apparent in Select Council, but Opponents Carry One Amendment Reducing the Speed

PHILADELPHIA, July 7. (Special Correspondence.)—The opponents of the automobile in Select Council renewed their attack when the Patton ordinance, which was recently almost entirely remodeled by the Law Committee (to which it had been referred), was reported by that body.

The original ordinance called for a maximum speed rate of five miles in the center of the city and of ten miles outside the travel-congested district. When it emerged from the committee the bill provided for a maximum rate of seven miles in the business center, ten miles in the residential sections and fifteen in the suburbs.

When the measure came up in Select Council last Thursday, Mr. Trainor, of the Third Ward, offered an amendment reducing the speed rate in the territory lying between the congested business district and the suburbs from ten to eight miles an hour. Notwithstanding the bitter opposition of the automobilists' friends, nearly all of whom had been present at the control tests, the "antis" carried the amendment by the close vote of 18 to 17.

Encouraged by their success, Mr. Trainor and his friends introduced another amendment designed to cut the limit in the outlying sections from fifteen to ten miles. It looked as if this would pass, too, but the motorists' friends, who had practically been caught napping when the first amendment was forced through, defeated the second amendment by making a solitary convert to their cause, and reversing the vote, so that it stood 18 for to 17 against the motion.

The success of the first amendment necessitated the postponement of final action on the measure until to-morrow, the printing of the amendment being required before the bill can legally be acted upon.

Postponed Until Fall

PHILADELPHIA, July 8. (Special Correspondence.) The automobile ordinance came up in both branches of Councils today, but the introduction of amendments prevented its passage, and it will rest peacefully until the next meeting on October 2. A Select Council amendment introduced a new section providing that nothing in the ordinance shall be construed to give any special privileges over other vehicles or pedestrians, and that the mere sounding of a gong or alarm signal shall not indicate any special right of way or the necessity for other vehicles or pedestrians to yield their ordinary rights to the highway.

As sent from Select Council the ordinance specified that automobiles could not be run to exceed 8 miles in the built-up section and not to exceed 15 miles elsewhere. In Common Council Mr. Castello moved to amend by making the speed limit 7 miles and 8 miles respectively, except at corners and curves, where 5 miles is all that will be permitted. The amendments were passed.

Father of the Bill a Complete Convert

A remarkable feature of the discussion was the fact that Selectman Patton, who was the father of the bill, had been completely converted as a result of the control tests, and vigorously opposed both amendments. He admitted that when he drew up the bill originally he had a very limited knowledge of the possibilities of automobile control until he had witnessed last week's exhibition on George's Hill. The automobilists, he said, had given evidence that they were as anxious to avoid accidents as their opponents; they had demonstrated to him, an old horseman, that their machines were more easily controlled than horse-drawn vehicles, and what they asked for was within reason. He was, therefore, against any change in the measure as it came from the Law Committee.

A FOUR MONTHS' TEST

E. V. Wilburn, a retired tobacco merchant of Cincinnati, is preparing to make a trip around the globe in a gasoline machine which is being built for him by H. W. Summer, who will accompany him on the trip. Two friends of the parties named will also

make the trip. The machine is said to be the finest piece of machinery of the kind ever built in this country, and the parties are going for the purpose of advertising the workmanship in the machine as much as anything else. It is stated that a plant will be established in Cincinnati to manufacture the machine, and this will be a great advertisement for it. In their route east the travelers will pass through Ohio, Pennsylvania and New Jersey. In New York City an exhibition of durability will be given. Thence they will take a steamer to Havre, France. Crossing France, they will visit Berlin, St. Petersburg, Moscow and Vladivostok. At the latter place they will take a steamer to Yokohama, Japan, and from there to San Francisco in the same way. Then the trip across the United States will be made, the southern route being chosen. It is estimated that it will take four months to make the trip.

CONNECTICUT AFTER FAST DRIVERS

The fast speeding of automobiles between Newport and New York and the increasing number of accidents for which motor vehicles are alleged to be responsible, has resulted in calling attention to the Connecticut law, which was adopted in 1901. Citizens are inclined to think this law is liberal in its provisions and explicit in defining legal speed. It limits the speed to 12 miles within the limits of all cities in the State and to 15 miles on highways outside of such limits. It also provides that the operator shall have the vehicle under control at all street intersections and shall slow up when passing horse-drawn vehicles, coming to a stop if the horse or horses show fright. Violations of the law make the offender subject to a fine of \$200.

The automobile stage service to Coney Island from New York has been a marked success from the outset, and the company has been compelled to put on additional carriages, which start at 1, 4 and 7 o'clock. Carriages carrying ten passengers each leave the Fifth Avenue Hotel at 10 o'clock daily, stopping at 25th St. and Broadway and at the Netherland Hotel.

A. L. Prescott, president of the Prescott Automobile Mfg. Co., of New York, made a 16-day trip over the hills of Connecticut and western Massachusetts, in one of the Prescott steam carriages. He covered more than 2,000 miles, making 196 miles on the last day. The trip is remarkable from the fact that notwithstanding the bad roads there was no expense for repairs. The same carriage is making 50 miles a day now.

The Sandusky Automobile Mfg. Co. has had places prepared for its new plant, to be erected in Sandusky, O., and work will begin in the near future. Meanwhile the company is pushing work on sample machines in temporary quarters.

LOCAL LEGISLATION

The Board of Freeholders of Middlesex County, N. J., on June 11 authorized the issue of \$150,000 worth of bonds for the construction of a bridge across the Raritan River, between Perth Amboy and South Amboy. Thus is made certain the completion of a long-distance roadway, which will shorten the distance from New York to Long Branch and Atlantic City by about 25 miles. The new bridge will mean the establishment of a boulevard of something like 150 miles through the country skirting the Jersey coast from Jersey City to Atlantic City.

At a meeting of the Board of Supervisors of Marin County, on the bay shore opposite San Francisco, held June 3rd, the district attorney was directed to draw up an ordinance changing the speed limit of automobiles from 15 to 10 miles, and requiring a full stop whenever passing other vehicles. In climbing the mountainous roads of Marin automobiles must take the outside of the grades. For any infringement of these regulations a fine of \$250 is imposed. Marin has been one of the counties favored by motorists.

The Board of Public Works of Newark, N. J., has applied to the City Council for advice regarding the use of three or more heavy steam trucks used by the licorice works and another used by brewers. These trucks weigh several tons, and transport heavy loads, and it is alleged they damage the street pavement and bridges, besides frightening horses.

A prospective ordinance under consideration by the Cincinnati, Ohio, Common Council limits the speed of automobiles in public parks to 6 miles, and also requires automobiles in public parks at night to have lighted lamps capable of being seen 200 ft. away, and to have bells or whistles, which must be sounded when approaching crossings.

The City Council of Janesville, Wis., has passed an ordinance limiting the speed of automobiles to 10 miles and providing a fine of \$10 for violation.

An ordinance was introduced at a meeting of the Village Board of Trustees in South Orange, N. J., on June 16 limiting the speed of automobiles to 10 miles and providing a fine of \$25 for the first violation, \$100 for the second and \$250 and imprisonment for 30 days for the third. The ordinance will come up for second reading at the July meeting.

More than 40 licenses were issued to automobilists in Cleveland, Ohio., on June 16, when the new ordinance went into effect.

An ordinance was introduced at a recent meeting of the common council of Kansas City, Mo., to regulate the speed of automobiles within the city limits.

An ordinance was introduced in the Select Council of Pittsburg, Pa., last week limiting the speed of automobiles to not more than 6 miles in the downtown district bounded by Water, Grant, Eleventh Sts. and Duquesne Way, and on the other streets where there are car tracks, and 10 miles elsewhere. A fine of not less than \$25 nor more than \$100 is provided for violators. The ordinance was sent to the committee on public safety.

A bill for an ordinance limiting the speed of motor vehicles in Harrison (part of Newark, N. J.) to 8 miles, was introduced in the Town Council last week. A fine of \$25 or imprisonment for 30 days in the Hudson County Jail is the penalty provided for violation.

A motion was adopted by the Common Council of Summit, N. J., last week to prepare an amendment to the ordinance providing a fine of \$100, thirty days' imprisonment, or both, in the discretion of the police justice, for exceeding the legal speed of 7 miles.

By a recent ruling of the License Commissioner of St. Louis, Mo., users of motor cycles must pay a license of \$10 per annum. Licenses were due January 1, 1902, and the license collector proposes to prosecute all delinquents after June 1.

A proposed automobile speed ordinance was on second reading in the Toledo Common Council last week, when a substitute amendment was adopted limiting the speed to 12 miles. There are not enough votes to give it a third reading.

A number of the suburban towns to the north of New York City, including White Plains and Scarsdale, both of which have adopted ordinances limiting the speed of vehicles to 8 miles, are preparing to co-operate to suppress excessive speeding by the establishment of stations along the main thoroughfares, connecting all of them by telephones and hiring watchmen to notify one another of any motorists who pass at illegal speed.

The committee on ordinances of the Common Council of Detroit, Mich., has before it an ordinance to provide that every owner of a motor vehicle must secure a license and have his vehicle conspicuously numbered. The penalty for violation is a fine of not more than \$25 for each offense.

In an order issued by the chief of police of Worcester, Mass., to call attention of the users of the streets to the danger of accidents and to prevent such disasters, the chief wisely cites the city ordinance relative to hitching standing horses as well as the laws regulating the speed and operation of automobiles, electric cars and bicycles.

Radnor Township (Pa.) policemen have been furnished with stop watches in order that they may have indisputable evidence to

offer the magistrate when they apprehend an automobilist for fracturing the township's 10-mile speed ordinance. Having previously measured a section of road—say a quarter of a mile—they time the approaching motorist for the quarter. If the unsuspecting operator happens to turn under 1:30, Radnor Township is soon \$10 to the good. Radnor Township's treasury is beginning to bulge.

PROPOSED MILWAUKEE ORDINANCE

MILWAUKEE, Wis., July 7. (Special Correspondence). An ordinance governing the operation of motor vehicles in the city streets, which was introduced in the council by Alderman Pringle, is now before the judiciary committee. As no opposition to it has developed, it seems likely to become a law. The measure limits the speed on streets generally to 8 miles; where streets are crowded, to 4 miles, and at street crossings and intersections to 4 miles. It also provides for the issuing of permits and numbers upon the payment of a fee of 25 cents, the numbers to be affixed to the machines in some conspicuous place. The proposed ordinance requires that every machine must be equipped with a brake or set of brakes that will bring it to a stop inside of 10 ft. when running 8 miles an hour, and that every machine must have a bell and two lanterns to show white lights in front and red behind. Fines of from \$1 to \$50, and possible imprisonment, not to exceed 90 days, are provided for violation of the different provisions of the ordinance.

NEWPORT MOTORISTS WARNED

NEWPORT, R. I., July 7 (Special Correspondence).—A warning to automobilists has been issued by Chief of Police Richards in response to the protest against fast driving signed by thirty-three prominent citizens. The warning has been printed in the form of a notice in which are reprinted extracts from the revised general laws of the State limiting the speed of vehicular travel to "a common travelling pace" in Newport and Providence and in the compact parts of any town or village in this State, and also the first, second and third sections of the ordinance of Newport passed June 12, 1900, which limits automobile, bicycle and carriage travel to six miles in the compact part of the city and to ten miles outside of such compact part.

Despite the warning given to Alfred Vanderbilt's chauffeur, the police were obliged to cause his arrest and fine him \$10, which he paid. He was warned not to be found guilty of the offense too often.

From advices recently received in this country by Ernest Cuenod, Switzerland will soon become an important factor in the automobile industry. Martini & Co., the famous gunmakers, have adopted some plans submitted by Mr. Cuenod, and will immediately start a factory at Neuchatel.

TRADE BREVITIES

Charles R. Greuter, of Springfield, Mass., has completed a handsome new gasoline automobile which is remarkable for strength and speed. Mr. Greuter has experimented for the last four years, and though he has turned out a number of excellent machines his latest production overshadows them all. The machine is built after the French style and has a tonneau body. It weighs 2,100 lbs., and when stripped for racing weighs 1,900 lbs.

A 20-h.p. Marienfeldt, the first machine of its kind to reach this country, has just been received by Smith & Mabley, of New York, who are American agents for several of the best French manufacturers. Smith & Mabley expect to receive their first consignment of French C. G. V. automobiles early in July.

The Reason Automatic Air Pump Co., of Detroit, Mich., has reorganized and increased its capital stock to \$25,000. Several prominent vehicle men have taken stock in the concern, and it is now proposed to manufacture all styles of air pumps. The new officers are: President, W. M. Reason; vice-president, A. G. North; treasurer, F. G. Jacobs; secretary and manager, H. A. Wright.

A contract just placed with the Mobile Co. of America, by Rievelly & Larzelere, of San Francisco, calls for a large shipment of automobiles to go to the Philippines. It is said that the United States Government intends to experiment with automobiles for carrying mail in the islands, and aside from this, automobiles are being shipped to the Philippines for heavy trucking.

The Macker Automobile Co., of Worcester, Mass., had its first machine out on the streets of that city on June 8, and it attracted considerable attention by its speed. The company has an order for several machines of the same type, which is a light car, built for speed.


The American Motor Vehicle Mfg. Co. was incorporated recently in the State of Maryland for the purpose of manufacturing automobiles, launches and motors. The offices will be located at New Haven, Conn., and it is stated that a factory is to be built at West Haven.

A. J. Coburn & Co. have removed from 43 Columbus Ave., Boston, to their new quarters, the Columbus Automobile Exchange, 147 to 153 Columbus Ave. They are agents for the Orient, Elmore, Crest and Darracq gasoline vehicles.

W. Walters, a machinery manufacturer at 49 W. 66th street, New York City, has completed a 12-h.p. motor-front tonneau of original design. It is equipped with a two-cylinder vertical motor, and all parts are of American manufacture.

STEEL RIMS

CRESCENT
AND DROP CENTER
FOR WIRE
OR WOOD WHEELS



ANY DIAMETER
UP TO 4 IN. CROSS SECTION

DRILLED OR UNDRILLED
AS REQUIRED

AUTOMOBILE AND CYCLE PARTS CO.
SMITH STAMPINGS FACTORY
Milwaukee Wisconsin

The first Toledo steam touring serry to leave the factory of the International Motor Car Co. on private purchase has arrived in New York at the station of A. E. Rainey, 306 W. 59th St. It is owned by D. A. Loring, of New York.

Cornelius H. Tangeman, Brooklyn, N. Y., has begun an action against the De Lion Bouton Motorette Co., of Jersey City, N. J., to recover the sum of \$2,480.25 for alleged breach of contract. The plaintiff had made a compact to trade a couple of automobiles to the Jersey City concern for a new machine and a cash consideration. The defendants have refused to carry out their part of the agreement, he says, and will not return the plaintiff's machines.

The new automobile storage and repair station that was opened on Tremont St., Boston, by H. B. Shattuck & Son on July 1, will be the largest establishment of its kind in New England. Messrs. Shattuck & Son, who are New England agents for the Oldsmobile, have secured the entire basement of the Cyclorama building for the purpose and are fitting it up with every appliance for the care of vehicles and the accommodation of patrons.

C. M. Spencer, of Hartford, has completed and delivered by road under its own power to R. H. Macy & Co., of New York, an 8½-h.p. steam delivery wagon that burns kerosene for fuel. The design of the wagon is also novel, the power plant being attached to the running gear. In the trial tests it is said to have run very satisfactorily.

The Knox Automobile Co., of Springfield, Mass., whose three 6 and 7 h.p. air-cooled

motor phaetons won first class certificates in the endurance contest of May 30, is experimenting with a 16-h.p. double-cylinder air-cooled motor vehicle which it expects to market next fall.

The police department of Atlantic City, N. J., has purchased from the Electric Vehicle Co., Hartford, Conn., one of its latest models of electric patrol wagons. The trial of the machine has given entire satisfaction.

It is reported that J. C. Wood, of Brooklyn, N. Y., and formerly of Worcester, Mass., has interested Brooklyn capital to the extent of \$40,000 for a half interest in an automobile of which he is the inventor.

The Back Bay Hydro-Carban Repair Co. has just been organized in Boston, Mass., for the purpose of repairing gasoline motor vehicles only, and conducting a storage station on Clarendon and Stanhope Sts.

Local business men of Whitney's Point, N. Y., are contemplating the formation of a company for the manufacture of automobiles. The machine has been invented and perfected in Cleveland, Ohio.

Since starting its daily excursion from the Fifth Avenue Hotel to Philipse Manor, the Mobile Co. has carried more than 1,000 persons. The journey is over an ideal route of about 60 miles up the Hudson.

A list of nearly 30 electrical charging stations in northern New Jersey has been published and distributed among automobile manufacturers, agents and clubs by the New Jersey Electric Co.

NOTES OF THE TRADE

Two months of night and day work with a largely increased force has so cut down the accumulated orders on the books of the Ohio Automobile Co., of Warren, O., that it is beginning to see daylight. When the management realized the large volume of business that it would secure this season, the factory equipment was increased two-thirds and more than 40,000 sq. ft. of floor space in a new building was added. Two forces of workmen, working day and night shifts, were then started on the production of the Model F Parkard machines. The company will now soon be able to make reasonably prompt deliveries and expects to be able to ship on two or three weeks' notice after July 1st.

A. J. Millman has opened an automobile storage and repair station at 4 Calhoun place, Chicago, between Dearborn and Clark streets, in the heart of the downtown district. In addition to storing, cleaning and keeping of vehicles in good running condition, Mr. Millman, who is an expert machinist, has a plant on the second floor that is sufficiently well equipped to do not only the most difficult repair work but also to re-model machines. The plant will be kept open day and night. C. B. Thackeray, who has been connected with the Locomobile Co. of America and other companies, is manager of the plant.

A novel and very good Fourth of July advertising wrinkle is that of the Diamond Rubber Co., of Akron, O., which just before Independence Day distributed folding mailing cars, decorated outside with a cannon-cracker exploding and Young America celebrating the glorious anniversary, while inside the company made the following announcement: "We regret to state that Diamond tires will not explode, so we enclose a cannon-cracker to make up for the loss." And glued to the card is an imitation cracker about three-quarters of an inch long.

The American Steel & Wire Co. was awarded ten gold medals, four silver medals and four bronze medals for its products exhibited at the South Carolina State and West Indian Exposition, which closed May 31st. These medals represent the highest awards in each class. They were awarded, among other articles, for automobile and bicycle spokes, for springs and spring wire, cold drawn steel shafting, iron and steel, wire rope, aluminum wire, etc.

The new Cleveland gasoline runabouts, made by the Hansen Automobile Co., of Cleveland, O., are described in a small catalogue just issued by the company. These vehicles have radiators arranged in the sloping face of the box front. A 6-h.p. single-cylinder motor drives them. They are provided with either center or slide lever steering, and are fitted with wire and artillery wheels. Simplicity of operation and control are leading features.

A patent on a gear and sector arrangement of steering connection in automobiles that is said to have been copied rather extensively in combination with wheel steering was granted on June 17 (No. 702,448) on inventions of H. P. Maxim and H. M. Pope, assignors to the Electric Vehicle Co., of Hartford, Conn. The patent was filed June 12, 1897.

Harry S. Moore is meeting with considerable success in introducing the Elmore in Cleveland, O. This vehicle, with its two-cycle, double-cylinder motor and peculiar

speed control, possesses so many unique features that Mr. Moore keeps two people busy demonstrating it.

The Vimotum Co., of Chicago, had one of its big gasoline trucks on the streets last week and it attracted much attention.

The Cleveland Automobile & Supply Co. is doing a good business with the Rambler gasoline runabout.

The Gas Engine Ignition Co., of Chicago, has moved from North avenue to 234 Larabee street.

THE SUBSCRIBER CONTROLS

a completely equipped factory in the central part of New York State; doing a profitable business, but desires to increase out-put by taking on a sideline. We are well fitted to manufacture Automobiles, either Steam, Gasoline or Electric. The Commercial vehicle preferred.

We do not care to undertake experimental development, but would contract to manufacture from approved practical designs.

We do not want to assume any responsibility as to selling the product and expect only a fair manufacturing profit. Only parties who can furnish best security for the fulfillment of a contract placed with us will be considered.

Address: Manufacturers

THE AUTOMOBILE AND MOTOR REVIEW

395 Broadway, New York

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Thomas A. Edison

in the North American Review for July, says:

"For safe and successful use, the automobile must be made with heavier running gear on the lines of the later French automobiles. Especially should stability be secured in the wheels and frame; the superstructure may be made gauzy.

"The French types of carriages come nearer to my ideas in strength and stability than any other models. This result has been attained, of course, only by experience. At first I was inclined to the opinion that the French machines were abnormally heavy; but when I study out the concussions and strains to which they are subjected, my inclination is to make the touring carriage even heavier still. It is surprising to me that American builders have not more closely followed these French models, since experiments costing millions must have been made to reach the present stage.

"We hear of fewer automobile accidents in France and in Europe generally than in our own country."

The new Charron, Girardot & Voigt car made at Rome, N.Y., from the latest French designs, under patents owned by us, is the first serious attempt to make a French automobile in this country.

Smith & Mabley

513-515 Seventh Ave.
NEW YORK

Special Notices

Advertisements of second hand vehicles or parts for sale, or for Positions Wanted, inserted under this heading at 10c per line. Remittance must accompany copy.

A GENTLEMAN having made exclusive arrangements with well-known French automobile manufacturers, wishes to meet party with money and influence to join him in establishing trade in America. Address, Laureau, 11 Waverly Place, New York. 12

FOR SALE—Friedman Road Wagon, 1902 Model, Double Cylinder, 6 horsepower, Wood wheels, 3 inch tires, in good order, run only 50 miles, Price \$650.00. Address: Box 280, Cedar Rapids, Iowa. 12

FOR SALE—Almost new Toledo steam carriage, latest model, top, mudguards, latest improvements, cost new \$1050, price \$700. A bargain. Address P.K., 6 West 122d St., New York City 12

POSITION as shop-superintendent in gasoline or steam manufactory by married man with good references. H. E. Barnhart, Warren, Pa. 8-19

Miscellaneous

Advertisements under this heading will be accepted at 5 cents per word per insertion. Remittance must accompany copy. Currency at sender's risk. 2 cent stamps accepted.

HOW TO BUILD A MOTOR LAUNCH—A simple and practical work in every detail, showing how to construct a launch hull suitable for use with any description of motor. Designs of several launches, from 15 to 50 feet in length. Heavily illustrated. The most complete treatise on launch building yet published. Bound in cloth. Price \$1.00. Book Dept., Motor Review, 385 Broadway, New York.

FOR SALE—THE PRACTICAL GAS ENGINEER, by E. W. Longenecker. A manual of the practical management and operation of all classes of explosive motors using gas, gasoline and similar fuels. Describes the general construction, the installation, piping, ignition system and running of motors for shops, launches and motor vehicles. Sent upon receipt of \$1.00. Book Department, Motor Review, 385 Broadway, New York.

A Very Practical Book on Automobiles

"Self-Propelled Vehicles" is the title of a very instructive book, written by James E. Homans, A. M., and just published by Theodore Audel & Co., 63 Fifth Avenue, New York, to whom orders should be sent. The price is \$5. As the title page sets forth, it is "a practical treatise on the theory, construction, operation, care and management of all forms of automobiles." It is indeed a "practical treatise," and in this feature differs materially from a great deal of literature on automobiles. It does not deal in theories only, but contains illustrations and descriptions of vehicles and parts actually on the market, and is thus an aid to the prospective buyer, not only in knowing what he should get but where it may be obtained. Gasoline, steam and electric vehicles and their parts are exhaustively and thoroughly described, and while it has been necessary to set forth some formulae in semi-technical language, the greater part of the book is written in plain, everyday language, so that any one of average intelligence can understand it. Sample pages and list of contents sent on request.

FOLDING RUBBER AUTO BUCKET



A NECESSITY ON ALL STEAMERS. Special price for next 60 days on Best Auto Bucket made.

C. S. KNOWLES, 7 Arch St., BOSTON

U. S. Long Distance Car

BOSTON AGENCY

G. T. GOULD, Jr., 43-45 Columbus Ave.

A. J. COBURN & CO. Automobiles & Motor Cycles

Sole Agents for
Orient, Elmore, Crestmobile
Headquarters for Famous
French Darracq Cars
147-153 COLUMBUS AVE., Columbus Automobile Exchange
BOSTON, MASS.

HERBERT L. TOWLE Automobile and Gas Engine Designer

Gasoline Speed Launches
Mechanical and Patent Office Drawings
116 NASSAU ST. NEW YORK
Telephone 590 John

Another Style!



We make the most complete line of OILERS, Grease Cups and Screw Machine Products.

SEND US YOUR ORDERS

BOWEN MFG. CO., Auburn, N. Y.

ALUMINUM

THE PITTSBURGH REDUCTION CO.

PITTSBURGH, PA.

Aluminum Automobile Parts a Specialty

The Motor de Luxe

Full of up-to-date features
Original, Simple and Reliable

MOTOR VEHICLE POWER CO.

1223 Spring Garden St.

Philadelphia, Pa.

MARSH MOTOR CYCLE

Wins Blue Ribbon

in Boston-New York

Endurance Run,

July 4-5.

Distance, 254 Miles.

MOTOR CYCLE MFG. CO.

Brockton, Mass.



WE CAN SELL YOUR AUTO

whether a \$15,000 Panhard or a motor cycle made with your own hands. We have customers for any and all kinds. Oldest established general Automobile Agency in the United States.

REFERENCE: The Publishers of this Paper

DU BOIS' AUTOMOBILE AGENCY, 220 Broadway, New York

**THE WATERBURY
FARREL FOUNDRY
and MACHINE CO.**

**WATERBURY,
CONNECTICUT,
U. S. A.**

DESIGNERS AND BUILDERS OF

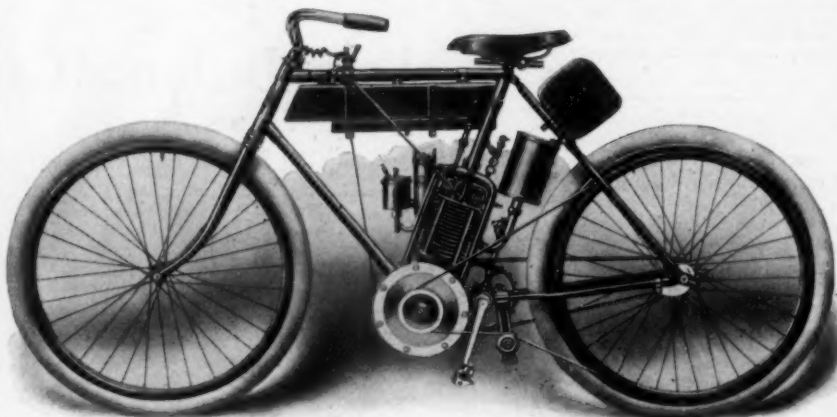
Sheet Metal Working and Special
Machinery Described in Catalogs.

A = Automatic Rivet Machines.
B = Hinge and Butt Machines.
C = Cartridge Machines.
E = Drop Screw and Foot Presses.
G = Tube and Rod Drawing Machinery.
H = Hydraulic Machinery.
L = Spinning Lathes, Edging Lathes, etc.
M = Open Back, Single Acting Power Presses.
N = Pillar Single Acting Power Presses.
P = Double Acting Power Presses.
R = Rolling Mills.
S = Shears and Slitters.
T = Furnaces, etc.



Holley Motor Cycle Finished First

Gold Medal Awarded



Scored 1000 points in the Boston-New York Endurance Run, July 4-5. This record was made by a regular 2¼ h.-p. model, over bad roads and unfavorable weather conditions.

HOLLEY MOTOR CO., Bradford, Pa.

Two ORIENT Motor Cycles Enter

**100
PER CENT.**

**100
PER CENT.**

Two ORIENT Motor Cycles Finish

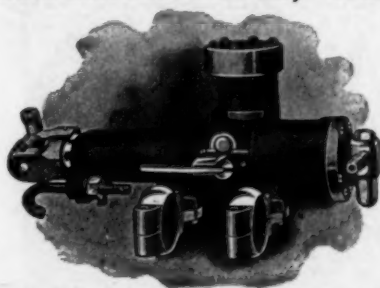
Winning highest honors and easily distancing all competitors in Boston-New York Endurance Run, July 4-5. The entire course of 254 miles, over all sorts of roads, up hill and down, was covered by *two regular stock model 3 h.-p. ORIENT Motor Cycles* without an accident, showing conclusively their strength and durability. ∴ ∴ ∴

TWO MORE GOLD MEDALS FOR THE ORIENT

The Orient is especially designed for Road Work and Hard Service

AGENTS EVERYWHERE CATALOG ON REQUEST

Waltham Mfg. Co., Waltham, Mass.

Reason Automatic Air Pump FOR STEAM VEHICLES

Keeps the air pressure in the fuel tank whenever desired automatically, without care or attention. We also make the REASON JR. AIR PUMP "Non-Automatic," which is controlled from the seat of the wagon. Write for circulars and description. Eastern Agents: Chas. E. Miller, 97 Rensselaer St., New York. Spalding Beadwell, 29 W. 42d St., New York. Post & Lester, Hartford, Conn.



This Is The Pump

you have been looking for.

MADE SO STRONG THAT IT CANNOT GET OUT OF ORDER.

That ought to be reason enough to make you buy one. But we take all the risk.

MONEY REFUNDED

if the pump is not entirely satisfactory. Write for price and discount.

The Cleveland Faucet Co.
CLEVELAND, OHIO

GOOD PATTERNS

will result in good work. We make a specialty of *accurate automobile patterns*. We want your work and will get it if quality counts : : : : :

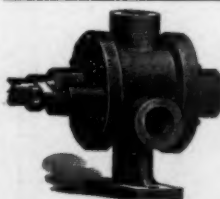
Balkwill Pattern Works

970 Hamilton St.
CLEVELAND, OHIO

The "International" Air Pump

formerly the "Detroit" Air Pump, has been adopted by the "Mobile" Company of America as regular equipment to "Mobiles." For further information address

The "International" Air Pump Company
180 Times Building, New York City



Is Your Circulation Good?
THE LOBEE PUMP increases and gives a positive circulation to the cooling water for all Gasoline Motors. Simple, Cheap, Durable, Efficient, easy to apply. Sent on trial to responsible parties.

LOBEE PUMP & MACHINERY CO.
130-144 Terrace, Buffalo, N. Y.



Lubricators, Oilers, Grease Cups, &c.

FOR GASOLINE ENGINES

WRITE US FOR PARTICULARS

The G. B. Essex Brass Co.
DETROIT, MICH.

TONKIN Dry Plate Boilers & Kerosene Burners
FOR AUTOMOBILES.

Tonkin
Boiler
Co.,



Oswego,
N. Y.

SAVE YOUR TIRES

and You Save Money



Use
"B. B."
Adjustable
JACKS

whenever you have your Auto standing for more than one day. The depression of your tires in **one spot** will get them

out of shape and finally ruin them.

STRONG, LIGHT, ADJUSTABLE

INSIST on having "B. B." Jacks when you buy them of your dealer or when furnished by your manufacturer. . .

BRAY MFG. CO.

Sole Makers
115 Broadway, New York, Factory NEWARK, N. J.



C. R. Wilson Carriage Co.,
Detroit, Mich.

This cut shows the tail-board down, creating room for two additional passengers. When closed up it makes an ideal one-seated vehicle.



CINCINNATI PANEL CO.,
CINCINNATI, OHIO.

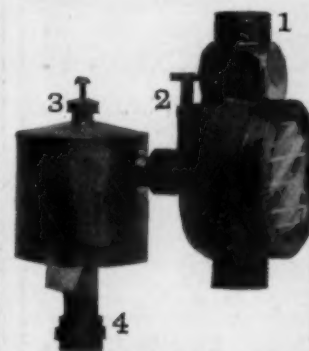


Dyke's Float Feed Carburettor

\$15.00

Only carburettor with perfect throttling lever—Only carburettor giving entire satisfaction. Used by some of the leading manufacturers. If you want the best, get Dyke's.

A. L. DYKE, Manufacturer
St. Louis, Mo.



Axiom

Carburetors are unaffected by changes in temperature.

They are, besides,
Automatic
and Positive
in Action
Economical
Simple
Compact
Reliable

"No Hidden Theories" —WRITE—
THE AXIOM CARBURETTOR MFG. CO.,
108 E. 28th St., New York.

.. THE ..

Cleveland Wire Spring Co.

CLEVELAND, OHIO

Manufacturers of

**HIGH GRADE, OIL TEMPERED
Spiral Steel Wire Springs**

OF ALL DESCRIPTIONS





HERE IT IS
The CHEAPEST
Reliable SAFETY
WATER COLUMN

That Has Ever Been Brought Out

OUR
"Auto-Pet"

SPECIFICATIONS:

Diameter of Column . . . 2 3/4 in.
Diameter of Top Flange 3 3/4 in.
Height over all . . . 13 in.
Height of Column . . . 8 in.
Size of Pipe Connections 1/2 in.
Weight complete . . . 6 1/2 lbs.

Everything except the Cover
Screws is made of Best Steam
Brass.

WE GUARANTEE the parts
in the "Auto-Pet" that cor-
respond to the floats in other
Alarms for five years under
any PRESSURE.

THEY CANNOT FAIL

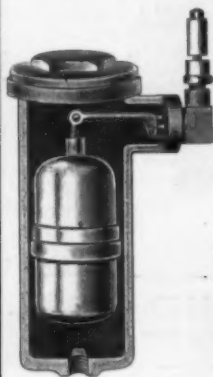
SMALL, SIMPLE, DURABLE
RELIABLE, POSITIVE

JARVIS ENGINE AND MACHINE WORKS

Lansing, Mich.

SMALL SPRINGS
OF ALL DESCRIPTIONS
ALSO THOSE USED BY
MOTOR VEHICLE
MANUFACTURERS
DUNBAR BROTHERS
ESTABLISHED IN 1845
BRISTOL CONN.

You Are Careless Now!



You think you do
not need a low
water alarm.

And consequent-
ly you are in a con-
stant state of worry.

If your automo-
bile boiler goes dry
it will cause trouble
— that's sure.

The Reliance
Low Water
Alarm

will prevent this happening — will
enable you to enjoy your outing.

Why not get one?

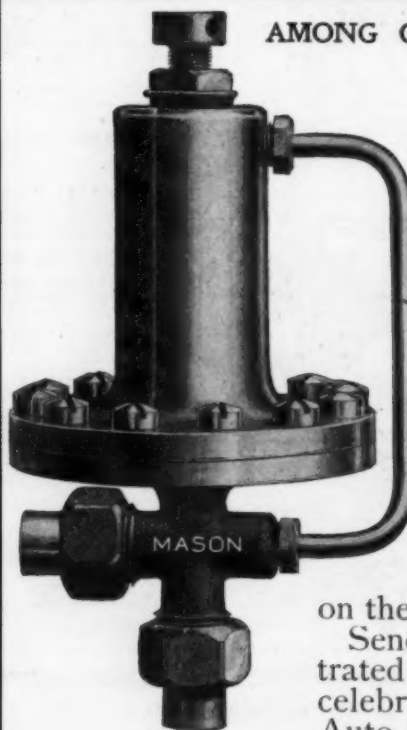
They are simple in construction,
cost but little, and are positive in
action.

Length 7 3/4 inches — diameter 2 3/4
inches; weight 4 lbs.

Booklet?

The Reliance Gauge Column Co.

45 EAST PROSPECT ST.
CLEVELAND, O.



AMONG OUR MANY APPLIANCES THE

MASON

AUTOMATIC

By-Pass Regulator

is proving most effect-
ive, as Auto users the
country over are de-
lighted with its effi-
ciency and simplicity.
This Regulator is ab-
solutely automatic,
and will always main-
tain an even pressure

on the auxiliary reservoir.

Send for our beautifully illus-
trated Catalogue describing our
celebrated Engines and all of our
Auto Appliances.

The Mason Regulator Co.
158 SUMMER ST., BOSTON

WE KNOW HOW

to make cylinder castings ACCURATELY. We have
work from the largest engine makers from the Atlantic
Coast to the Pacific. . . Let us know your wants.

ERIE FOUNDRY CO., Erie, Pa.

If Your Springs Are Giving You Trouble, Write Us



We are making a Specialty of a Strictly High Grade
Spring for Automobiles. They are tempered in oil,
and for easy riding and durability cannot be surpassed

GARDEN CITY SPRING WORKS
CHICAGO, ILL., U.S.A.

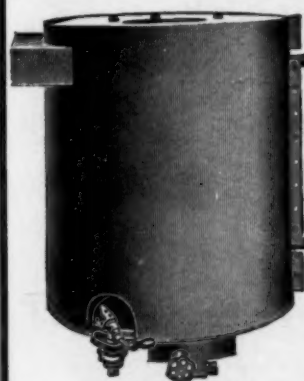


SPRINGS

ALL SMALL SPRINGS USED BY
MOTOR VEHICLE MANUFACTURERS

THE WALLACE BARNES CO.
BRISTOL, CONN.

CATALOGUE B UPON APPLICATION ● ● ● SUBMIT SAMPLES FOR PRICES



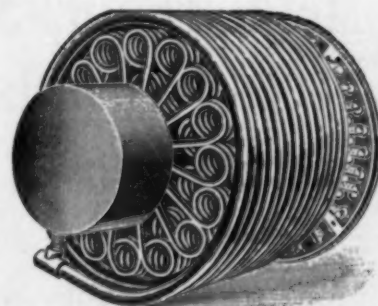
You May Have Your Doubts

BUT WE HAVE SUBSTANTIATED
ALL THE CLAIMS WE MAKE FOR

SALAMANDRINE Never-Burn-Out-Boilers

Salamandrine Boiler Co. 220 Broadway, New York

WORKS: NEWARK, N.J., U.S.A.



Automobile and Marine

**Boiler Shells & Pressure
Tanks** SEAMLESS COLD DRAWN
SMOOTH STEEL

All diameters and any length
Write for New Illustrated Price List

JANNEY, STEINMETZ & CO. 740 DREXEL BLDG.
PHILADELPHIA

Automobile GASOLINE GENERATOR



The Turner Gasoline Pocket
Torch generates so easily it
only requires the heat of one
match to generate and light it.
Price \$2.00 each.

The TURNER BRASS WORKS
62 No. Franklin St., Chicago, Ill.

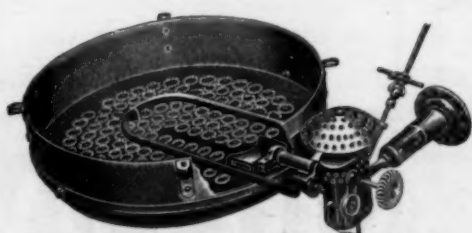


DIETZ KEROSENE AUTOMOBILE LAMP

Embodies the experience gained in 60 years'
of Lamp building. Send for particulars

R. E. DIETZ COMPANY 33 LAIGHT ST.
NEW YORK

THE FORG GASOLINE BURNERS



Single Compartment Burner with Generator and Regulator

Are the BEST CON-
STRUCTED, give a
BLUE FLAME AND
MORE HEAT than
any other burner
manufactured . . .



Generator and Regulator for
Single Compartment Burner

PETER FORG, Somerville, Mass.

Write for Descriptive Catalogue

IT WILL PAY YOU to solicit subscriptions for the AUTOMOBILE AND MOTOR
REVIEW. For full information address Class Journal Co., 395 Broadway, N. Y.



THE KELLY GENERATOR

STANDS UNSURPASSED

A Continuous Generator and Pilot Light. Quickly
Lighted. No Flare. No Smoke. Clean, Powerful,
Simple and Durable. *Main Fire Operated from Seat.*
Protected against wind. We would caution against the
so-called pilot lights. The Kelly is the *Only Reliable* and
Perfect Combined Generator and Pilot Light Made.

THE KELLY HANDLE BAR CO., Cleveland, Ohio

Metal FENDERS Hoods & Bonnets

Are Right in Our Line
Our GOODS ARE RIGHT
So are our prices
Write us

EASTMAN METALLIC BODY CO.
184 KINSMAN ST. :: CLEVELAND, OHIO

Incontestably The BEST



ARTICLE OF ITS
KIND EVER
OFFERED
TO THE
TRADE

SAMPLE F R E E
UPON APPLI-
CATION

The HOTELLING BROS. Co.
268 E. 35th St., CHICAGO, ILL.

Randolph-Clowes Co.

WATERBURY, CONN.

Brass and Copper Rolling Mills
AND
Seamless Tube Works

Seamless Copper Shells

FOR

AIR, GASOLINE AND
MUFFLER TANKS

Copper Tubes and Shells

FOR

AUTOMOBILE BOILERS

BRANCH OFFICE

NEW YORK CHICAGO
715 Postal Tel. Bldg. 602 Fisher Bldg.

Subscribe

The AUTOMOBILE
and
MOTOR REVIEW
will enable you to
intelligently
discuss all
automobile topics

WHEELS

TUBULAR STEEL WHEELS

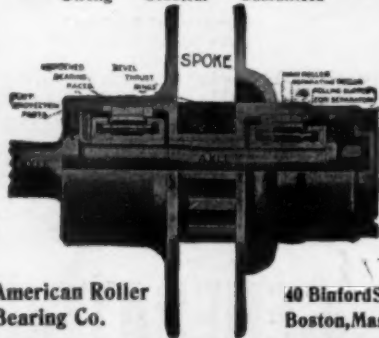
Strong
Neat
Durable

Write for our NEW CATALOG

AMERICAN TUBULAR
WHEEL CO. Pittsburg, Pa.

ARB Artillery Hubs

Strong — Graceful — Guaranteed



American Roller
Bearing Co.

40 Binford St.
Boston, Mass

Rims That Are Right!

MANUFACTURED BY

THE STANDARD WELDING CO.

Eastern Sales Agents
Miller, Thornburgh & Co.
135 Broadway, New York

CLEVELAND, OHIO

Chicago Office
1117 The Rookery

SHELBY

SEAMLESS

STEEL TUBING

in your automobile
means a *successful* and
satisfactory product.

You cannot afford to
take chances with *un-
tried* material.

Send us your specifications

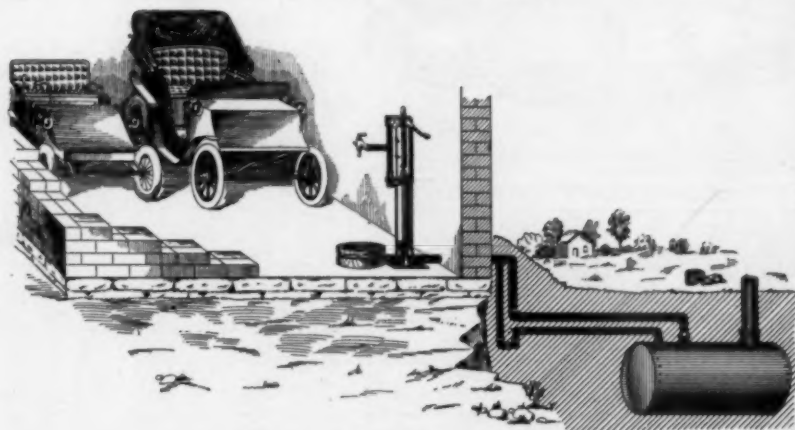
Shelby Steel Tube Co.
PITTSBURG, PA.

Take No Risks With Gasoline

BUT USE A

Bowser Long Distance Gasoline Storage Outfit

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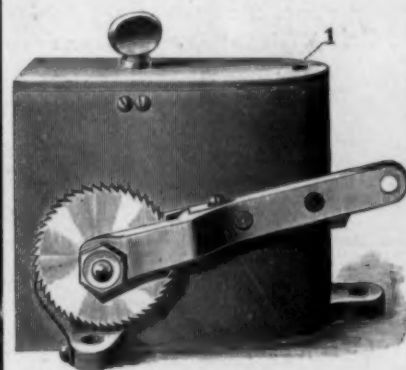
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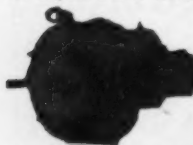
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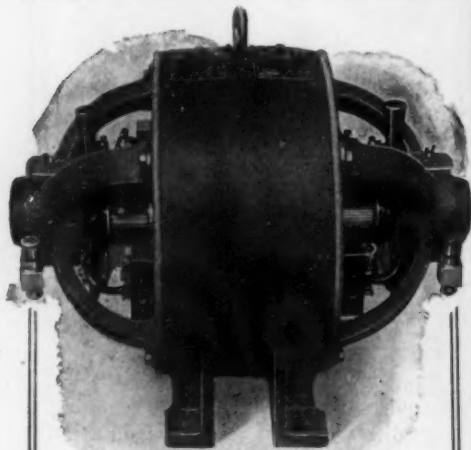
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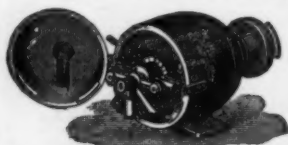
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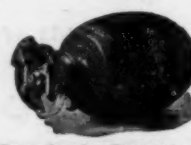
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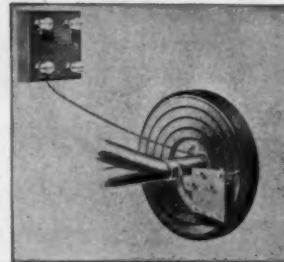
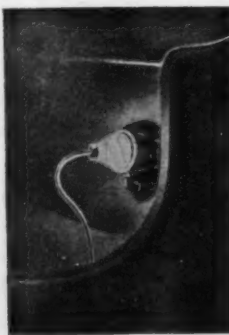
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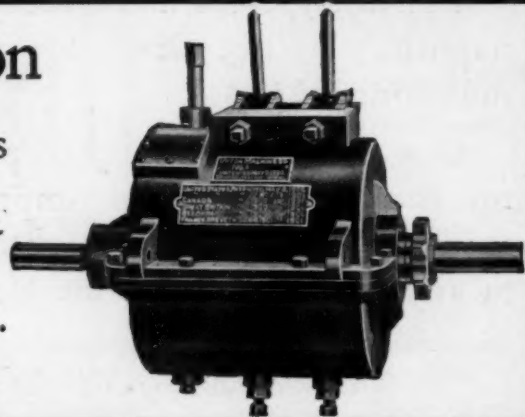


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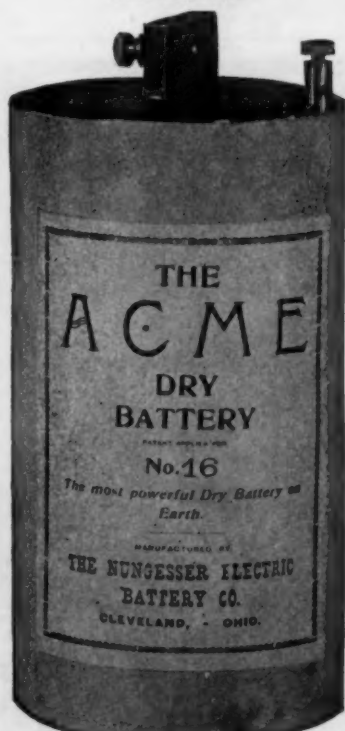
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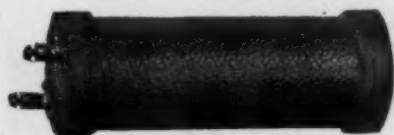


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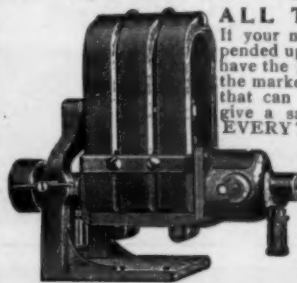
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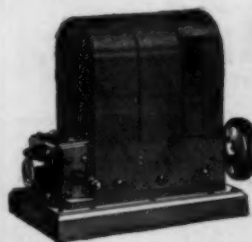
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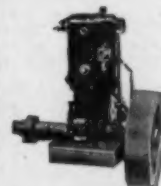


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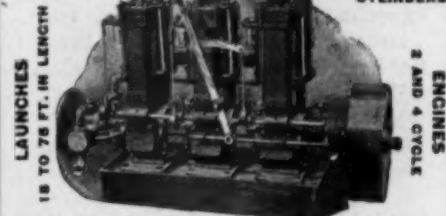


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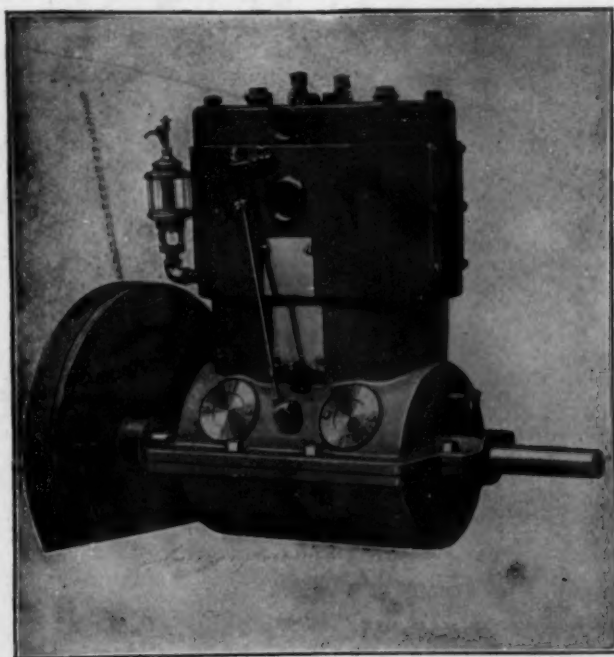
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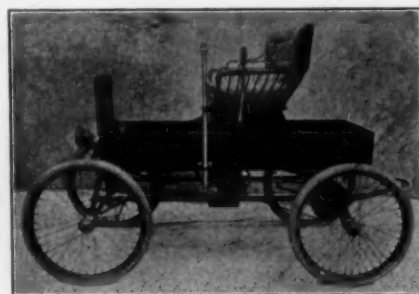
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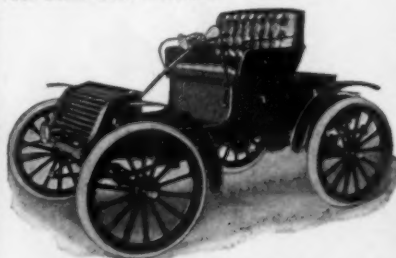
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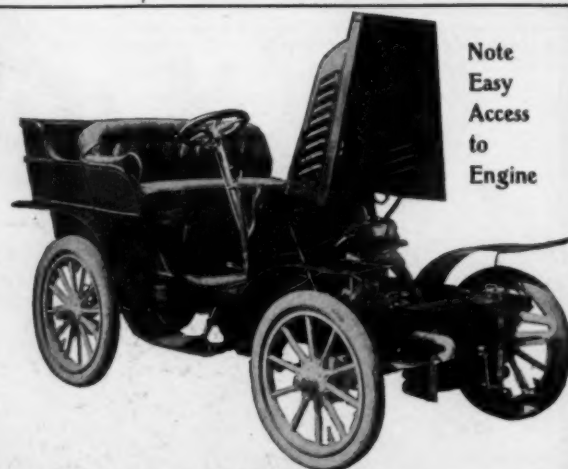
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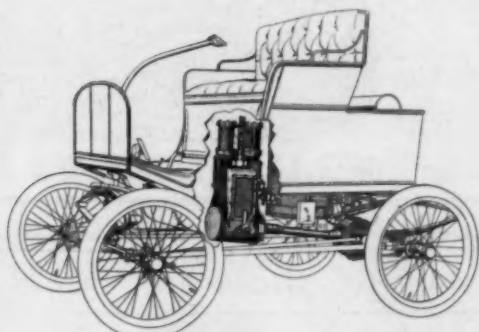
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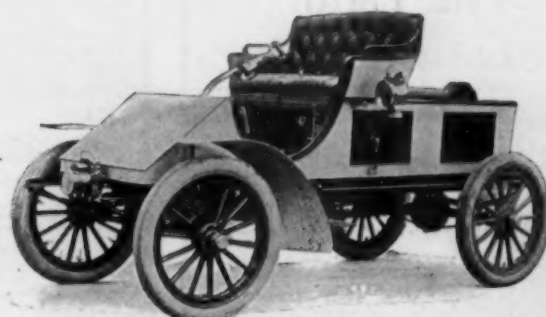
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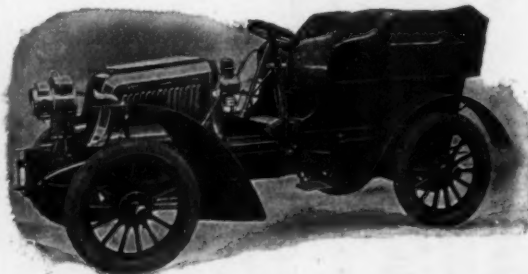
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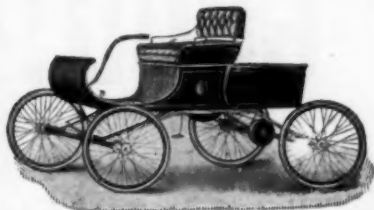
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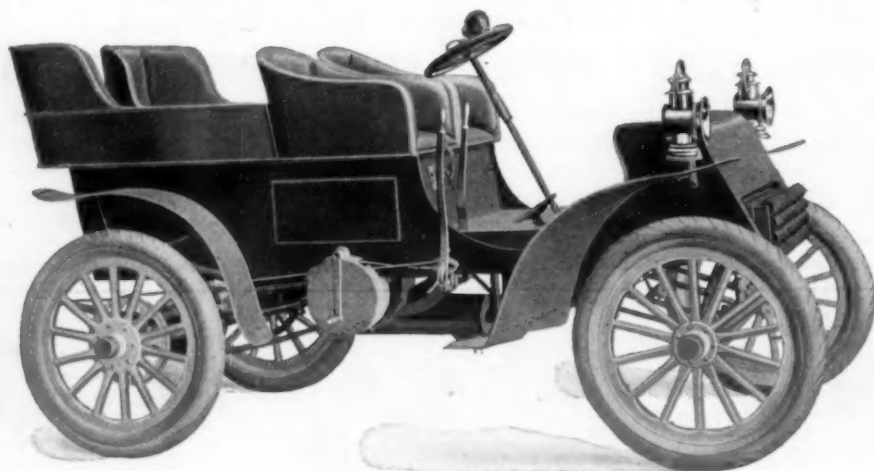
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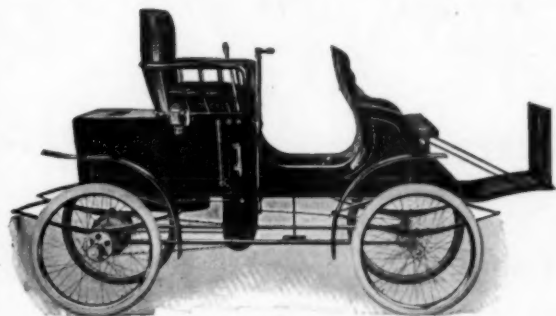


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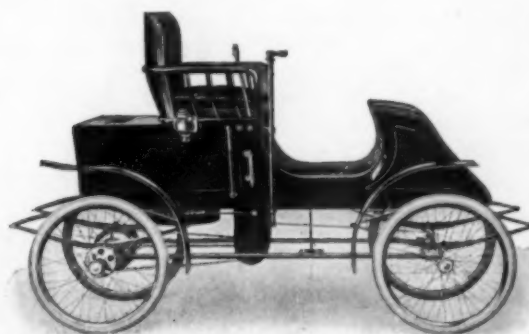
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